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RARY

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State Associations and Other Organizations Entitled to Representation Should Not Overlook the Appointment of Delegates to the House of Delegates, A. Ph. A., the Conference of Pharmaceutical Secretaries and Conference of Pharmaceutical Law Enforcement Officials—Miami, Fla., during Week of July 27th.

Vol. XX, No. 6 JUNE, 1931

JOURNAL

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE 79th ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN MIAMI, FLA., DURING WEEK OF JULY 27th. HEADQUARTERS, COLUMBUS HOTEL. LOCAL SECRETARY, G. H. GROMMET, 2364 S. W. 11th ST., MIAMI.

The 1931 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conferences of Pharmaceutical Association Secretaries and of Pharmaceutical Law Enforcement Officials will also be held at Miami, same time and place. The Plant Science Seminar will be held at Gainesville, Fla., during the week of July 20th.

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ON TO MIAMI.

A ROUND-TRIP rate of one and one-half, or one and three-fifths good for 30 days, on the identification plan has been obtained and this ticket will be available for those who cannot use the excursion ticket. It will be on sale from July 17th to August 1st, and earlier at distant points. Identification certificates will be distributed to A. PH. A. members and can be obtained from the Secretary's Office, 10 W. Chase St., Baltimore, Md.

Arrangements have been made with the Florida East Coast Railway and the Seaboard Air Line Railway that holders of round-trip tickets to Miami or points between Miami and West Palm Beach, under either the excursion or identification plan, can visit both coasts of Florida without additional cost by rail, or they can drive from Miami to Tampa over the Tamiami Trail. Those traveling by boat should inquire promptly about special excursion rates and stop-over privileges. The famous Pan-American Airport is located within twenty minutes' ride to the Hotel Columbus. For Cuban trip—see page 419, May JOURNAL.

All tickets can be validated at the Hotel Columbus and this should be given prompt attention upon arrival.

HOTEL RATES.

	Single room per day.	Double room per day.
Columbus Hotel (Headquarters)	$3.00, $4.00 and $5.00	$6.00, $7.00 and $8.00
Hotel McAllister	$3.00 and $4.00	$6.00 and $7.00
Hotel Everglades	$3.00, $4.00 and $6.00	$6.00, $7.00 and $8.00
Miami Colonial Hotel	$3.00 and $4.00	$6.00 and $7.00

Those who plan to attend should make reservations promptly either directly to the hotel or through Local Secretary G. H. Grommet.

Further information relative to the meeting will be found elsewhere in this issue.

JULIUS H. RIEMENSCHNEIDER.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XX JUNE, 1931 No. 6

THE PRESIDENT OF THE NATIONAL ASSOCIATION OF RETAIL DRUGGISTS, 1930–1931.

Julius H. Riemenschneider was born in New York City, December 13, 1873. He received his earlier education in Germany and, later, after returning to the United States, he attended the Pharmacy School of Northwestern University at Chicago. After serving as apprentice and then as clerk for about sixteen years, he embarked in business on his own account at 2916 Broadway, Chicago, in February of 1903, and since then he has continued his pharmacy at the same location, gaining an enviable reputation as pharmacist among co-workers, physicians and patrons.

President Riemenschneider exemplifies his belief that there is no influence for pharmacy stronger for promoting its general welfare and of the drug business than that of business and professional men banded together and coöperating for improvement and service. Early in his business career he took an active part in local and state association affairs, and the value of his service was recognized by his election as president of the Chicago Retail Druggists' Association in 1913, and two years thereafter as head of the Illinois Pharmaceutical Association. His work in these offices pointed him out as a valuable member for the executive committee of the National Association of Retail Druggists and he was duly elected to serve on the committee in 1919 and since 1921 he has been its chairman.

As the growth of coöperation stimulates the growth and strength of an organization, and the public measures the importance of its work by the degree of coöperation of its members, so also is the association prompted in a related way in the selection of its officers; hence the election of Mr. Riemenschneider to the highest office of the National Association of Retail Druggists was largely responsive to his services.

The subject of this brief sketch is also an active and esteemed member of the AMERICAN PHARMACEUTICAL ASSOCIATION.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase Street, BALTIMORE, MD.

ON TO MIAMI.

MONTHS go by quickly; it seems only a short time ago since the members of the AMERICAN PHARMACEUTICAL ASSOCIATION met in Baltimore and now preparations must be made for the convention in Miami. Particular attention is called to impress the fact on the Section officers that the programs must be in the hands of the Secretary this month; partial programs are printed in this issue. Contributors of papers should get in touch with the officers of the sections for which their papers are intended.

Carbon copies of the contributions may be sent to the Editor of the JOURNAL; titles and abstracts of the papers should be prepared and mailed in order to assist in giving publicity and enable all pharmaceutical publications to give an account of the work of the section. Prompt coöperation by members and officers is earnestly asked for—please do your part so the General Program may go on the press before the end of this month.

TRANSPORTATION TO FLORIDA.

The approaches to Miami are (1) by automobile, (2) by the Florida East Coast Railroad down the East Coast and connecting at Jacksonville with the Atlantic Coast Line, The Southern Railway and other trunk lines, (3) by the Seaboard Air Line Railway down the West Coast, (4) by various steamship lines from Atlantic and Gulf ports and through the Panama Canal, (5) by various Air Lines.

Those who plan to motor should consult the automobile association and arrange the trip so as to see both coasts of Florida. The state roads are excellent and connect with highways to all sections of the country. The famous Tamiami Trail crosses the state from Miami to Tampa.

The Railroads offer two rates and those expecting to travel by rail should consult their ticket agent well in advance and inquire about side trips and return by other routes. There is a low rate round-trip excursion ticket good for 30 days, with stop-over privileges, from points bordering on and outside of the Southeastern Passenger Association Territory. Those using this ticket must arrange to leave from or pass through New York, Philadelphia, Baltimore, Washington, Chicago, St. Louis, Cincinnati, Memphis or stations south and east of these cities, on July 25th. If this ticket is not available at any station, an excursion ticket may be purchased to some point where it is sold.

THE TRIP TO CUBA.

A five-day excursion following the meeting has been arranged for and the visitors will be entertained at several events by the Cuban Pharmaceutical Association. To Key West the trip will be made over the ocean railroad, as it is called—bridged from key to key—and from Key West by boat to Havana. Trips are planned to points of interest in and around Havana and one all-day trip to the interior. The special train will leave Miami on Saturday morning—August 1st—and Havana will

be reached in the afternoon. The return trip will be made on Wednesday—August 5th—reaching Miami in time to connect with outgoing through trains leaving that evening. Reservations for this trip should be made promptly.

References to the meeting will be found elsewhere in this issue; the purpose of this comment is to call attention to the urgency of completing the programs.

COLOR NAMES IN THE PHARMACOPŒIA.

BACK in 1921, attention was called to the need of carefully checking the names of colors as used in the monographs of the Pharmacopœia. The use of the term "blackish-white" aroused an inquiry as to which color names and how many were used in the Pharmacopœia. Nearly 300 different color names were used, a total of more than 2000 times in U. S. P. IX.

A color chart of 100 to 150 different colors with a simple nomenclature was proposed for inclusion in the Pharmacopœia. As the preparation of such a color chart would require much careful and extended investigation, its inclusion in U. S. P. X could not be accomplished. However, an endeavor was made to replace the more odd, bizarre and objectional of the color names in U. S. P. IX by more suitable ones in U. S. P. X.

The Board of Trustees of the U. S. P. encouraged further study of this question. It is very evident that the problem of designating colors is not limited to the medical or pharmaceutical professions alone, but exactly the same problem is met with in many lines of science, art and industry.

Out of this work on color names there was presented in May 1930 at the U. S. P. Convention in Washington an extended report, accompanied by a large exhibit of color charts, color standardization apparatus and illustrations of the lack of uniformity in color-name vocabularies. A meeting of many scientists, artists, teachers and professional men interested in color resulted in the formation of a committee to consider the organization of a national color council.

During the past year the Optical Society of America and other organizations have become interested in some of the ideas presented in the U. S. P. color report and just recently at a large representative gathering in New York City, the Inter-Society Color Council has been authorized and it is now in process of organization. It is proposed that this Inter-Society Color Council shall deal with just such problems as the U. S. P. color names have evolved.

The following proposal has been drafted as the basis of the first investigative work of the Inter-Society Color Council:

The Request.—A means of designating colors in the U. S. Pharmacopœia, in the National Formulary and in general pharmaceutical literature is desired; such designation to be sufficiently standardized as to be acceptable to science, sufficiently broad to be appreciated and usable by science, art and industry and sufficiently commonplace to be understood by the whole public.

Two Simple Illustrations.—The following is a quotation from the monograph on Aloe in U. S. P. X page 41:...

"upon separating the benzene layer, and adding to it 5 cc. of ammonia T.S., a permanent, deep rose color is produced in the lower layer."

The term "deep rose color," in itself, is not objectionable. That is, it is a term easily read and grasped by the public; it is a very proper term to be used in science, art and industry; but it is *not* sufficiently standardized to be acceptable to science, nor indeed does it have a really definite meaning to anyone.

The following terms occur in the U. S. Pharmacopœia: ....

"pale green tint, distinct greenish tinge, slightly greenish, pale greenish, greenish tint, faintly green, pale green."

Are these terms synonymous or are there distinctions in meaning among them? If there are distinctions in meaning among them, where can one learn what those distinctions are?

The Problem:—Is it not possible for the Inter-Society Color Council to so standardize our present (and future) English vocabulary of color names that the following results will be accomplished?

(*a*) Each name should be limited to a fairly restricted field of color.

(*b*) This limitation to be established by certain designations on the charts of pigment colors; by certain curves or readings obtained with the spectroscopic colorimeters; by comparison with certain colored fluids (glass, etc.) in the comparator colorimeters, and by other suitable means.

(*c*) The definitions or limitations to be so accurate that science will accept them (at least to an extent); so broad that science, art and industry can use them (to a large extent); so popular that the public can understand them (at least in a general way).

The Accomplishment.—We all know that the solution of the problem stated above is not easy. Perhaps some of us do not realize how difficult (perhaps impossible) this solution may be of accomplishment. Certainly there will be necessary great acumen, great perseverence, great patience and finally much compromise. The accuracy and strictness of science must give way to some extent to the sensitiveness of art, and the carelessness of the public. Art must bury her idiosyncrasies, jealousies and critical attitudes. The public must be taught by a long period of education the need of more care in the naming of colors. The accomplishment will be possible only by:

(*a*) An organization or group formed by science, art and industry, and receiving the wholehearted support and confidence of each of these portions of our public.

(*b*) A well-prepared plan wrought out by the best minds representing all those interested in color.

(*c*) A strong financial support for the engagement of adequate talent and personnel.

(*d*) The devotion of one or more talented lives to head up and push forward the work.

The Results.—Pharmacy and Medicine would no longer be compelled to use haphazardly chosen, undefined terms to designate colors in connection with medical standards and descriptions. More time and effort would be required to determine the proper word or term by which to designate a color, but once this be determined the name would have a real, definite meaning. No doubt other professions, arts and industries would also find such defined terms of great value in their respective fields.

Other results that might be accomplished are as follows:

(*a*) A limitation upon the coining of new color names. If the Inter-Society Color Council becomes sufficiently strong and respected, it could publicly state that no new color names

would be recognized by science, art or industry, except they conform to the rules laid down by the Council. One of these rules might be that new color names should be originated and applied only to colors that are new or had not yet received any designated name.

(*b*) Perhaps many of our present-day color names could be synonymed. Just how many of them could be eliminated in this way is a matter of interest.

E. N. GATHERCOAL.

PHARMACOPŒIAL VITAMIN CONFERENCE.

A CONFERENCE of experts in vitamin investigation was held under the auspices of the U. S. Pharmacopœial Board of Trustees and Committee of Revision on May 7th. The report, in part, will be found under Committee Reports. It is worthy of note that there were present at the Conference the discoverers of both A and D vitamins and others who have been the pioneers in this work. The standards worked out after thorough study will become effective before the completion of the next edition of the Pharmacopœia; in other words it may be termed an interim revision.

The accepted opportunity and willingness of coöperation by manufacturers through their laboratorians and other auxiliary workers with the Committee of Revision speaks well for coöperative efforts that should produce a new edition of the standard, which will maintain its foremost rank among pharmacopœias.

THE COSTS OF MEDICAL CARE AND PUBLIC HEALTH.

THE committee on the Costs of Medical Care met in Washington on May 15th and 16th. The work of the committee, now in its fourth year of activity, is underwritten by a group of philanthropic agencies which include the Rockefeller Foundation, the Russell Sage Foundation, the Twentieth Century Fund, the Milbank Memorial Foundation, the New York Foundation and the Josiah Macy, Jr., Foundation. Five main questions are being studied by sub-committees: (1) To what extent should an attempt now be made in the United States, with due consideration to economic and geographic variations, to supply all the people's needs for medical service? (2) What general and specialized personnel and what buildings and equipment should be provided for supplying this medical service? (3) How may personnel and equipment be organized so as to insure the highest practicable quality of service and the maximum economies in the use of equipment, and of the time of both practitioner and patient, compatible with adequate return to the persons and agencies providing service? (4) Should there be agencies in local communities to plan for existing and future medical needs and to provide for the coordination of all medical services? (5) To what extent should payment of medical services be based upon individual purchase or upon group purchase?

Pharmacy is interested and represented in this work as evidenced by the questions of the foregoing studies. Dr. Robert P. Fischelis and Dr. C. Rufus Rorem are members of the research staff, and are preparing a joint study of the "Service of Pharmacy" as it pertains to medical care. The status of pharmacy as a profession is largely dependent on its service in the protection of health and the education of the public relative to the importance of that service. It is necessary that pharma-

cists not only have adequate pharmaceutical education and training, but put these into practice, so that the public may understand the purpose of the restriction of the selling and dispensing of medicines, which otherwise may only mean to them the handing out of a labelled package. Without the professional service whereby the public is protected the drug business becomes a competitive merchandising enterprise.

Maryland has had a pharmacist on the State Board of Health for a number of years and pharmacy is ably represented in its laboratories and other activities, strengthened and supported by the coöperative interest of an outstanding Governor. In other states pharmacists fill corresponding appointments; Colorado has recently come into the lines of State health service and Texas has enacted legislation which provides for a pharmacist on the Board; it is a hopeful sign of public interest for, after all, legislatures are representative in a degree, of the public viewpoint; these opportunities must be made best use of, if pharmacy would gain thereby and make progress.

There is to-day less of the personal contact and relation between pharmacists and the public than formerly, but pharmacy receives more publicity than formerly, which sometimes is embarrassing; it is, therefore, of importance that pharmacy receive the right kind of publicity, and to that end what druggists do is a matter of great concern to pharmacists.

THE 1931 CONGRESS OF MILITARY MEDICINE AND PHARMACY.

"IN 1921 the King of the Belgians, recognizing the importance to humanity of preserving and standardizing the dearly bought experiences of the World War as regards the rescuing of the wounded in battle and the preserving of the armed forces from disease, called an international Congress of Medicine and *Pharmacy* which met in Brussels in July 1921. Twenty countries sent official representatives to this congress, and its results were so valuable that subsequent congresses were held in Rome in 1923, Paris in 1925, Warsaw in 1927 and London in 1929, thirty-nine countries being officially represented at the last named meeting."

The United States has accepted an invitation extended to the Netherlands Government and was officially represented by delegates at the Sixth Congress of Military Medicine and Pharmacy held at The Hague, June 1st–6th. The following delegates were appointed: Capt. James C. Pryor, Chairman, M. C., U. S. Navy; Commander William Seaman Bainbridge, M. C.-F., U. S. Naval Reserve; Colonel Ralph A. Fenton, Medical Reserve, U. S. Army; Lieutenant-Colonel Francis E. Pronczak, M. C., U. S. Army; Major Edgar Erskin Hume, M. C., U. S. Army; Colonel Angus McLean, Auxiliary Reserve, U. S. Army; Colonel Charles R. Reynolds, M. C., U. S. Army; Colonel Frederick H. Vinup, Maryland National Guard; Assistant Surgeon General R. C. Williams, United States Public Health Service.

No objection is raised regarding the appointments, except that Pharmacy was *not* represented. Other countries appoint pharmacists; why not the United States? No pharmacist was appointed to the Geneva Conference; no pharmacist was appointed on the National Advisory Health Council and none on The Conference Board of the National Institute of Health. Pharmacists took an active part in

encouraging the passage of the bill creating the National Institute of Health. Unquestionably, no other organization contributed more to formulating Anti-narcotic laws than the AMERICAN PHARMACEUTICAL ASSOCIATION. No further comment will be made at this time.

THE GENEVA CONFERENCE FOR LIMITATION OF THE MANUFACTURE OF NARCOTICS.

THE basis for narcotic control is stated in the following:

"It is indefensible for any civilized nation knowingly to permit the wrecking of human lives through the illegitimate use of these drugs. And it is likewise indefensible for any civilized nation not to do all in its power to suppress this illicit traffic."

"In the United States every step in the production of narcotic drugs, including all derivatives and the exempt preparations, is carefully supervised by the Government, from the orders for the raw materials down through the manufacture and the distribution. One result of this is that the legitimate per capita consumption has been reduced to about three grains per year excluding codeine and the exempt preparations, and to about six grains including all derivatives and compounds. In contrast to this are the corresponding figures of eight grains and twelve grains, respectively, in some other countries where production is not so supervised. On the other hand, there is no doubt that the illicit traffic in the United States is large, judging from the frequent seizures of considerable quantities of drugs; but there is no way of determining how large it is, for it is built almost entirely on drugs smuggled into the country."

John Caldwell, America's Chief delegate, addressed the League of Nations' conference for limitation of the Manufacture of Narcotics, May 30th.

He found none of the plans before the conference was satisfactory in the present form and urged that they be completed by extending limitation and control to raw materials and then to all derivatives of opium and coca leaf instead of to a specified list of manufactured narcotics.

After briefly mentioning that the United States was deeply interested in drug limitation, because the lack of it resulted in "enormous quantities" of narcotics intended for illicit trade reaching the United States in recent years, Mr. Caldwell closed by expressing appreciation for the Canadian delegates' tribute a few days ago to the strictness with which the United States controlled the manufacture of narcotics and for the coöperation which Washington received from Ottawa in fighting the narcotic traffic.

The AMERICAN PHARMACEUTICAL ASSOCIATION has pride in its contributory work to the limitation of the use of narcotics; its PROCEEDINGS bear records of the earliest efforts and legislation on this important subject.

MAKING THE PHARMACIST, PHARMACY, DRUGS AND DRUGGIST BETTER ACQUAINTED WITH THE PUBLIC.

"FIGHTING Disease with Drugs" has just come off the press and has been accorded the distinction of second rank among the new books on science for the month of May. The work has been prepared under the direction of the National

Conference of Pharmaceutical Research and the editorship of Dr. John C. Krantz, Jr. A more extended notice will be found in the division of "Book Notices and Reviews," but the importance of the book for pharmacy and pharmacists deserves an editorial comment. There are books on historical pharmacy, but "Fighting Disease with Drugs" has a different purpose—it is to acquaint not only pharmacists and physicians with drugs used in medicine, but more particularly the public, so that a better understanding may be had of drugs and of pharmacy, and the part which the search for drugs, their discovery and manufacture has played in the development of commerce, science, education and the industries. The thought which prompted the preparation of this book, now brought to completion, will mean much for pharmacy and pharmacists; it presents an opportunity of acquainting physicians and the public with the subjects discussed by men who speak with authority of their respective studies and activities.

A comment states that "It is an entertaining story of human endeavor, of the evolution and perfection of a vital service to society. And it is a story which can scarcely fail to lead to better understanding of the business of getting well and keeping well.

DR. JOHN GORRIE'S SERVICE TO HUMANITY.

Florida is represented in Memorial Hall of the Nation's Capitol. His name is memorialized because of his invention of ice-making and refrigeration by mechanical means, because he was actuated by the purpose to cool the rooms of a hospital for fever patients; his energies were bent on an air-cooling system for the benefit and comfort of the sick and to make treatment of these cases more effective. He first directed his efforts of controlling fever by cooling the patient by external means and this is reported in the press of about 1845. The medical profession has profited by his investigations, but the name of Dr. Gorrie is not often referred to, hence, the coming meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION in Miami prompted this brief reference to a great benefactor of the afflicted. He is deserving of the title "Father of Mechanical Refrigeration," and he foretold the application of refrigeration to preservation of foodstuffs and cooling of hospitals, other institutions and homes by such means. Dr. Gorrie practiced medicine in Charleston, S. C. and Apalachicola, Fla. He deserves the honor paid him and references to his work should be made more accessible.

CANADA'S FIRST PHARMACIST.

The AMERICAN PHARMACEUTICAL ASSOCIATION will meet next year in Canada. The premier-colonist of Canada was Louis Hébert, born in Paris, son of the apothecary to the court of Catherine de Medici, and Louis was trained in the same profession. Several references to this pharmacist have heretofore been made—see volume of 1929, page 155, and page 805, 1930. This Apothecary had the advantage of his knowledge of botany which aided him in his agricultural work; for as a student and with a desire for service, everything was to him a matter of serious study and, hence, the results of his work contributed largely to the development of Canada. So beneficial was the work of this apothecary-colonist to New France that the King created him Seigneur of the lands he had cleared. In enobling Louis Hébert the King's Minister felt that his services had not been sufficiently rewarded and, therefore, added a further grant of land. He died in Quebec in January of 1627, lamented by Europeans and the early settlers, and the Indians joined in testimony to the love and respect they bore for him.

PRODUCTION OF PHARMACEUTICAL PRODUCTS IN JAPAN.

Statistics furnished by the Japan Pharmaceutical Society indicate that the production of pharmaceuticals in 1929 was considerably increased. Production figures follow: 1927, $32,700,000; 1928, $28,000,000; 1929, $40,000,000. The increase in 1929 is due partially to the inclusion of serums and preparations for injections. Among the leading products manufactured in 1929 were: White petrolatum, $6,000,000; menthol crystals, $2,800,000; peppermint oil, $2,000,000; salvarsan, $900,000. (Assistant Trade Commissioner H. B. Titus, Tokyo.)

SCIENTIFIC SECTION

COLOR REACTIONS IN THE SYSTEM, PHENOL–ALDEHYDE–ACID.

BY VICTOR E. LEVINE.*

In the course of time many color reactions have been described for various compounds of interest to the organic and to the biologic chemist. Among such compounds may be mentioned alcohols, aldehydes, ketones, carboxylic acids, carbohydrates, phenols and alkaloids. The purpose of this paper is to bring out the fact that a great many of these color tests in biological chemistry revolve about the system, phenol–aldehyde–acid. Phenols and aldehydes interact in the presence of a dehydrating agent to form chromogenic compounds.

By means of this system we can prepare reagents to test for any one of its three components. Thus, to test for phenol it is necessary to make up a reagent containing aldehyde and acid; to test for aldehyde, a reagent containing phenol and acid; and to test for acid, a reagent containing aldehyde and phenol. By the use of this system we can therefore secure tests for

1. Phenols of all types, such as mono, di- and triphenols, phenolic ethers and esters, phenolic glucosides and phenolic alkaloids.
2. (*a*) Aldehydes.
   (*b*) Aldehydogenic substances.
   - I. Alcohols which yield aldehydes on oxidation.
   - II. Trihalogen alkyl derivatives, like chloroform, bromoform or iodoform, which on treatment with alkali yield a salt of formic acid, a carboxylic acid regarded as possessing aldehydic properties.
   - III. Carboxylic acids, like citric, oxalic or lactic acid, which react in the presence of sulphuric or hydrochloric acid to form aldehydes.
   - IV. Carbohydrates which yield the aldehyde, furfural, on treatment with sulphuric or hydrochloric acid.
   - V. Alkaloids, like narcotine, narceine and hydrastine, which yield the aldehyde, opianic acid, on treatment with acid.
3. Inorganic acids, such as hydrochloric or sulphuric acid.

TESTS FOR PHENOLS.

In order to identify phenols it is necessary to make up a reagent which would complete the system, phenol–aldehyde–acid. Such a reagent would consist of an aldehyde and an acid. Melzer's reaction for phenols in general and Mörner's reaction for the phenolic amino acid, tyrosine, are illustrations of the practical application of the system, phenol–aldehyde–acid.

TABLE I.

Author of reaction.	Test for phenols.	Reagent. Aldehyde.	Acid.	End result.
Melzer	Benzophenol	Benzaldehyde	H_2SO_4	Violet-blue
Mörner	Tyrosine	Formaldehyde	H_2SO_4	Green
Udransky	Morphine	Furfural	H_2SO_4	Purple, changing to blood-red

* Department of Biological Chemistry and Nutrition, The Creighton University, School of Medicine, Omaha, Nebraska.

TABLE I.—*Concluded.*

Author of reaction.	Test for phenols.	Reagent. Aldehyde.	Acid.	End result.
Pettenkofer	Morphine	Furfural, indirectly through the action of acid upon sucrose	H_2SO_4	Purple, changing to blood-red
	Oxydimorphine	Furfural, indirectly through the action of acid upon sucrose	H_2SO_4	Purple, changing to blood-red
Levine and Magiera	All types of phenols	Formaldehyde	H_2SO_4	Usual color purplish red, although there are many individual variations

In 1896 Marquis first reported his test for the opium alkaloids depending upon the color produced with formaldehyde in the presence of concentrated sulphuric acid. These alkaloids are either phenols or phenolic ethers. They fit in, therefore, with the scheme of the system, phenol–aldehyde–acid. Levine and Magiera have shown that the Marquis reagent is a valuable and practical general reagent for phenols.

TABLE II.—MARQUIS' TEST FOR PHENOLIC ALKALOIDS.

Test for phenolic alkaloids.	Reagent. Aldehyde.	Acid.	End result.
Morphine	Formaldehyde	H_2SO_4	Purplish red changing to violet, and finally becoming blue
Oxydimorphine	Formaldehyde	H_2SO_4	Green*
Codeine	Formaldehyde	H_2SO_4	Violet
Apomorphine	Formaldehyde	H_2SO_4	Violet
Narcotine	Formaldehyde	H_2SO_4	Olive-green, changing to yellow

* According to Fulton, oxydimorphine gives a red color, the green being due to the presence of oxidizing impurities.

TABLE III.—OTHER TESTS FOR PHENOLIC ALDEHYDES.

Test for phenolic alkaloids.	Reagent. Aldehyde.	Acid.	End result.
Codeine	Chloral hydrate	H_2SO_4	Carmine-red
Codeine	Furfural	H_2SO_4	Purplish red
Narcotine	Furfural	H_2SO_4	Greenish yellow color passing through yellow, brownish yellow, brown and brown-violet, and intense blue-violet

TESTS FOR ALDEHYDES.

We find that some of the well-known reagents for aldehydes consist of a mixture of phenol and concentrated hydrochloric or sulphuric acid. The reagent, phenol and acid, and the aldehyde complete the reaction system, phenol–aldehyde–acid.

TABLE IV.—TESTS FOR FORMALDEHYDE.

Test for aldehydes.	Reagent. Phenol.	Acid.	End result.
Formaldehyde	Benzophenol	H_2SO_4	Red ring
Formaldehyde	Resorcin	H_2SO_4	Red color

Formaldehyde	Naphthoresorcin	HCl	Flocculent precipitate, darkening on standing
Formaldehyde	Guaiacol	H_2SO_4	Violet ring
Formaldehyde	Pyrogallol	H_2SO_4	Chocolate-brown color
Formaldehyde	Phloroglucin	HCl	Finely divided precipitate, solution becoming orange in color
Formaldehyde	Gallic acid	H_2SO_4	Green ring, changing to deep blue ring
Formaldehyde	Thymol	H_2SO_4	Brown ring
Formaldehyde	α-Naphthol	H_2SO_4	Blue ring

TABLE V.—TESTS FOR OTHER ALDEHYDES.

Test for aldehydes.	Reagent. Phenol.	Acid.	End result.
Paraformaldehyde	α-Naphthol	H_2SO_4	Dark brown ring
Paraformaldehyde	Thymol	H_2SO_4	Upper layer of ring, blue; lower layer of ring, deep pink
Acetaldehyde	α-Naphthol	H_2SO_4	Greenish brown ring
Acetaldehyde	Thymol	H_2SO_4	Deep red ring
Paraldehyde	α-Naphthol	H_2SO_4	Dark brown ring
Paraldehyde	Thymol	H_2SO_4	Deep brown ring
Chloral hydrate	α-Naphthol	H_2SO_4	Greenish blue ring
Chloral hydrate	Thymol	H_2SO_4	Reddish brown ring
Glyoxylic acid	α-Naphthol	H_2SO_4	Green and bluish ring
Glyoxylic acid	Thymol	H_2SO_4	Deep pink ring

FURFURAL.

Furfural is an aldehyde which is a derivative of the five-membered heterocyclic ring, furfurane. It is obtained in the decomposition of carbohydrates by means of concentrated hydrochloric or sulphuric acid. Its importance as a degradation product of carbohydrate is shown by the fact that some of the best known tests for carbohydrates in general or for specific types of carbohydrates depend upon its formation.

TABLE VI.—TESTS FOR FURFURAL.

Author of reaction.	Test for aldehyde.	Reagent. Phenol.	Acid	End result.
Molisch	Furfural	α-Naphthol	H_2SO_4	Reddish violet zone
Levine	Furfural	Thymol	H_2SO_4	Dark green zone
Bial	Furfural	Orcinol	HCl	Green solution or a green flocculent precipitate

Ketones may replace aldehydes in the reaction system, phenol–aldehyde–acid.

TABLE VII.—TESTS FOR KETONES.

Tests for.	Reagent. Phenol.	Acid.	End result.
Acetone	α-Naphthol	H_2SO_4	Greenish brown ring
Acetone	Thymol	H_2SO_4	Brown ring
Pyruvic acid	α-Naphthol	H_2SO_4	Yellowish green ring
Pyruvic acid	Thymol	H_2SO_4	Yellowish brown ring
Ethyl acetoacetate	α-Naphthol	H_2SO_4	Upper layer of ring, green; lower layer of ring, reddish
Ethyl acetoacetate	Thymol	H_2SO_4	Reddish brown ring

TESTS FOR ALDEHYDOGENIC COMPOUNDS.

The system, phenol–aldehyde–acid, can be conveniently employed for the alcohols which yield aldehydes on oxidation. Methyl and ethyl alcohol may be de-

tected through their respective oxidation products, formaldehyde and acetaldehyde. Glycerol may also be detected through its oxidation products. When this trihydroxy alcohol is oxidized by chlorine or bromine, dihydroxyacetone is formed and eventually aldehyde, methyl glyoxal. After oxidizing the glycerol, the excess of bromine or chlorine is driven off. An alcoholic solution of orcinol, resorcinol or the phenolic alkaloid, codeine, is used together with concentrated sulphuric acid as the reagent to detect glycerol through its oxidation product, an aldehyde. In the Mandel-Neuberg test for glycerol, oxidation is brought about by means of sodium hypochlorite. The aldehyde, glycerose, which is formed, is made to react with orcinol and hydrochloric acid to give a beautiful green color.

TABLE VIII.—TESTS FOR GLYCEROL.

Tests for aldehydogenic compounds.	Reagent. Phenol.	Acid.	End result.
Glycerol	Orcinol	H_2SO_4	Beautiful violet or greenish blue
Glycerol	Resorcinol	H_2SO_4	Wine-red color
Glycerol	Codeine	H_2SO_4	Beautiful greenish blue on heating

TESTS FOR TRIHALOGEN DERIVATIVES OF METHANE.

Chloroform, bromoform and iodoform react with potassium hydroxide to form potassium formate. Since formic acid may be structurally regarded as being an aldehyde as well as a carboxylic acid, we may state that the reaction system, phenol–aldehyde–acid, can be used as a means of detecting the halogen derivatives. That this is the case is evident from the Schwarz resorcinol test and the Lustgarten naphthol test for chloroform, bromoform or iodoform.

TESTS FOR CHLOROFORM.

Author of reaction.	Test for aldehydogenic halogen derivatives.	Reagent. Phenol.	Alkali.	End results.
Schwarz	Chloroform	Resorcinol	NaOH	Yellowish red color attended by a beautiful yellow fluorescence
Lustgarten	Chloroform	α or β-Naphthol	KOH	Evanescent blue color, changing in contact with air to green, then to brown

In the above tests alkali is used instead of acid. The alkali is used to decompose the trihalogen derivatives. That acid can take part in the reactions is shown by the fact that the evanescent blue solution obtained with Lustgarten's reagents can on acidification be converted into a red dyestuff.

TESTS FOR ALIPHATIC CARBOXYLIC ACIDS.

Certain acids, among them oxalic, citric, succinic, malic, tartaric, glycolic and lactic acids, react on treatment with strong sulphuric to yield formaldehyde, formic acid or acetaldehyde. Owing to the formation of aldehyde, these acids readily respond to tests with reagents containing a phenol and concentrated sulphuric or hydrochloric acid.

TABLE IX.—TEST FOR ALIPHATIC CARBOXYLIC ACIDS.

Test for aldehydogenic acids.	Reagent. Phenol.	Acid.	End result.
Succinic acid	Resorcin	H_2SO_4	Yellowish red solution with green fluorescence
Malic	α-Naphthol	H_2SO_4	Blue color, changing to green on heating

Tartaric	α-Naphthol	H_2SO_4	Intense blue color
Tartaric	Resorcin	H_2SO_4	Bright red color
Tartaric	Pyrogallic	H_2SO_4	Fine violet-blue color
Cysteine	Thymol	H_2SO_4	Pink ring
Cysteine	α-Naphthol	H_2SO_4	Violet ring
Lactic	Thymol	H_2SO_4	Yellowish brown ring
Lactic	α-Naphthol	H_2SO_4	Yellowish green ring
Oxalic	Thymol	H_2SO_4	Pink ring
Oxalic	α-Naphthol	H_2SO_4	Purple ring
Citric	Thymol	H_2SO_4	Pink ring
Citric	α-Naphthol	H_2SO_4	Purple ring
Citric	β-Naphthol	H_2SO_4	Greenish yellow, changing to bright yellow on heating

According to Deniges, *p*-cresol, guiacol and codeine can be used as reagent for the detection of glycolic or lactic acid. Glycolic on treatment with sulphuric acid yields formaldehyde, while lactic acid under similar treatment yields acetaldehyde and formic acid.

Carbohydrates themselves are either aldehydes or ketones. On this account they should respond to the system, phenol–aldehyde–acid. In addition, the carbohydrates on treatment with concentrated sulphuric or hydrochloric acid yield the aldehyde, furfural. Formic acid and the ketonic acid, levulinic acid, are also formed in the reaction with concentrated acid.

TABLE X.—TESTS FOR CARBOHYDRATES.

Author of reaction.	Test for carbohydrates.	Reagent. Phenol.	Acid.	End result.
Molisch	All carbohydrates, glycolipins and glycoproteins	α-Naphthol	H_2SO_4	Reddish violet zone
Seliwanoff	Ketoses	Resorcin	HCl	Red color and separation of brown-red precipitate on heating
Tollen	Glycuronates	Naphthoresorcinol	HCl	After heating, mixture extracted with ether, which assumes violet-red color
Bial	Pentose	Orcinol	HCl and $FeCl_3$	Green color and green flocculent precipitate

Cotarnine and hydrastinine contain an aldehyde group. Both of these alkaloids react with phenols in the presence of concentrated sulphuric acid. Some other alkaloids decompose with concentrated sulphuric acid to give aldehydes. Narcotine, narceine and hydrastine yield on hydrolysis the aldehyde, opianic acid.

TABLE XI.—TESTS FOR ALDEHYDE-ALKALOIDS OR ALDEHYDOGENIC ALKALOIDS.

Test for alkaloids.	Reagent. Phenol.	Acid.	End results.
Cotarnine	Thymol	H_2SO_4	Brownish ring, changing to purplish brown
Cotarnine	α-Naphthol	H_2SO_4	Brownish orange ring
Cotarnine	Pseudomorphine	H_2SO_4	Strong bright green color in the presence of nitric acid
Hydrastinine	Thymol	H_2SO_4	Brownish pink ring, changing to cherry-red
Hydrastinine	α-Naphthol	H_2SO_4	Brown ring
Hydrastinine	Pseudomorphine	H_2SO_4	Strong blue-green color in the presence of nitric acid
Narcotine	Thymol	H_2SO_4	Purplish pink ring, changing to reddish brown
Narcotine	α-Naphthol	H_2SO_4	Orange ring
Narcotine	Pseudomorphine	H_2SO_4	Strong bright blue-green color in the presence of nitric acid

Narceine	Thymol	H_2SO_4	Reddish brown ring
Narceine	α-Naphthol	H_2SO_4	Brownish yellow ring
Narceine	Resorcinol	H_2SO_4	Carmine to cherry-red ring
Narceine	Tannin	H_2SO_4	Yellowish brown at first, soon turning to green
Narceine	Pseudomorphine	H_2SO_4	Strong bright green color in the presence of nitric acid
Hydrastine	Thymol	H_2SO_4	Purplish pink changing to violet
Hydrastine	α-Naphthol	H_2SO_4	Brownish ring
Hydrastine	Pseudomorphine	H_2SO_4	Strong blue-green color in the presence of nitric acid

The reactions of the aldehyde alkaloids and the aldehydogenic alkaloids with thymol and with α-naphthol have been described by Levine. The color reactions obtained with pseudomorphine in the presence of nitric acid have been reported by Fulton. This investigator has recently pointed out that the addition of an oxidizing agent like bromine or nitric acid in the system, phenol–aldehyde–acid, changes the color obtained in the same system free from oxidizing agent.

It is interesting to note the fact that John Uri Lloyd in his popular novel, *Stringtown on the Pike*, published in 1900, introduces into the murder trial, of Red Head, a fallacy with regard to the fading purple test used for strychnine. This test is obtained on treatment of strychnine in sulphuric acid with an oxidizing agent like potassium dichromate. Lloyd points out that a mixture of hydrastine and morphine produces the same result. From our viewpoint, morphine and hydrastine fit in with the reaction system, phenol–aldehyde–acid. Morphine is a phenol, and hydrastine yields the aldehyde, opianic acid, on treatment with sulphuric acid. The addition of an oxidizing agent to the system is in harmony with Fulton's idea of an oxidizing agent in our reaction system converting the initial color of the reaction into some other color. It now becomes simple to understand that when Lloyd treats a mixture of morphine and hydrastine with concentrated sulphuric acid, a pale yellow color forms, gradually deepening as it stands. On the addition of a fragment of potassium dichromate a play of color develops ranging from purple to maroon-red.

TESTS FOR FREE INORGANIC ACID.

The reaction system, phenol–aldehyde–acid, is a useful one in detecting inorganic acid, such as hydrochloric or sulphuric acid. Boas' test and Günzberg's test serve to detect free hydrochloric acid in gastric contents. The reagents used, phenol and aldehyde, complete the triple system, phenol–aldehyde–acid.

TABLE XII.—TESTS FOR FREE INORGANIC ACID.

Author of reaction.	Test for free acid.	Reagent. Phenol.	Aldehyde.	End result.
Boas	Free acid in stomach contents	Resorcinol	Cane sugar (yielding furfural with acid)	Rose-red color after heating
Günzberg	Free acid in stomach contents	Phloroglucin	Vanillin	Purplish red color after heating

To obtain a positive reaction with the Boas and the Günzberg test heating is required in order to concentrate the small amount of free acid present in gastric contents.

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C. C. Fulton, "Aldehyde Oxidation Reactions for Phenols, Particularly the Opium Alkaloids," *Journal Association of Official Agricultural Chemists*, 12 (1929), 434.

V. E. Levine, "A General Test for Carbohydrates," *Proceedings of the Society for Experimental Biology and Medicine*, 22 (1930), 831.

New Group Conception.—A century of progress—International Exposition, Chicago, 1933. Rising from colored concrete terraces the fourth Fair building—Hall of Science—in which the Pharmacy Exhibit will be placed. Space is now being assigned for the exhibits. See April JOURNAL, page 313.

EUROPEAN PHARMACEUTICAL CONVENTIONS.

The Society for Chemical Industry will meet in London during the week of July 13th. A Liebig celebration will be held at Giesen, Germany, July 19th. Holland Pharmaceutical Association will meet at Utrecht, July 6th–8th. The British Pharmaceutical Conference will meet at Manchester, July 20th.

IMPORTS OF CRUDE DRUGS.

Crude drugs in recent years have attained an increasing prominence in import trade of the United States coincident with the rapid growth of the American pharmaceutical, proprietary medicine, insecticide and other consuming industries, according to the Commerce Department's Chemical Division.

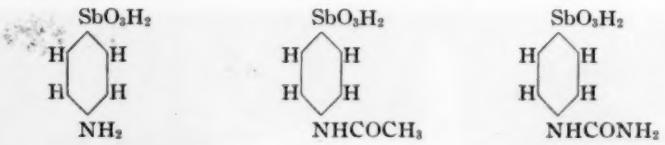
The increasing domestic requirements are reflected in the gradually expanding volume of United States imports of crude drugs, which increased over 140 per cent during the past 10 years, from 68,215,000 pounds in 1921 to 165,176,000 pounds in 1930. While production of many of these products is widely diffused throughout the world, most of the drugs upon which industry is principally dependent possess well-defined areas of cultivation.

This is true of cinchona bark, originating principally in the Netherland East Indies; nux vomica, which is produced largely in British India and French Indo-China; senna in Egypt and British India; licorice root in Soviet Russia, Turkey and Iraq; pyrethrum flowers in Japan and Yugoslavia; derris root in the Malay Peninsula and Borneo; aloes in the Dutch West Indies; papain in Ceylon; ergot in Russia and Spain; psyllium seed in France; orris root in central and southern Europe and buchu leaves in South Africa.

THE PREPARATION OF 3-CARBAMIDO-4-HYDROXYPHENYL-ARSONIC ACID.*

BY W. G. CHRISTIANSEN AND A. E. JURIST.

Stovarsol, 3-acetamino-4-hydroxyphenylarsonic acid, has been known for some time and has been used widely in the treatment of amœbic dysentery and, more recently, as a prophylactic against syphilis. Brahmachari (1) prepared a series of antimony compounds and found that of the three given below the carbamido compound III was superior to either the amino or acetylamino compounds in pharmacological action.



By analogy 3-carbamido-4-hydroxyphenylarsonic acid should be superior to Stovarsol. It is proposed here to describe in detail the preparation of 3-carbamido-4-hydroxyphenylarsonic acid.

Ehrlich and Bertheim (2) describe briefly the preparation of both the 3-acetamino-4-hydroxyphenylarsonic acid, Stovarsol, and the 3-carbamido-4-hydroxyphenylarsonic acid. The method described here is similar to that of Ehrlich and Bertheim but is given in greater detail as follows:

Eleven and six-tenth grams of 3-amino-4-hydroxyphenylarsonic acid was dissolved in 100 cc. of $N/2$ sodium hydroxide solution. This solution was then treated with 12 Gm. of potassium cyanate and 12 Gm. of glacial acetic acid, successively, and was then allowed to stand for 24 hours. While standing a small amount of 3-amino-4-hydroxyphenyl arsonic acid separated out. This was removed by filtration and the dark brown filtrate decolorized partially by stirring with a decolorizing carbon. The light brown, clear, alkaline filtrate from the carbon was acidified by the gradual addition of concentrated hydrochloric acid (U. S. P.). Five cc. of acid made the solution acid to litmus, but the 3-carbamido-4-hydroxyphenylarsonic acid did not begin to separate until the solution had been made acid to congo red by the addition of 15 cc. more of hydrochloric acid. When the solution was acid to congo red an additional five cc. of acid were added making a total of 25 cc.; then the product precipitated. The mixture was allowed to stand for four hours and then chilled in ice for two hours more. The white precipitate was collected on a Buechner funnel, washed with water and then air-dried. Yield: 10 Gm. or 77%.

In order to purify this substance and at the same time make it more convenient for biological testing the substance was converted into the sodium salt which is readily water soluble; the free acid is only slightly water soluble. This was accomplished by dissolving 7 Gm. of the acid in 150 cc. of water and 1.14 Gm. of sodium hydroxide and filtering. The clear solution was then poured into 500 cc. of 95% alcohol stirring vigorously. Precipitation was not immediate and was started by removing a small portion in a test-tube, starting crystallization by scratching the

* Scientific Section, A. PH. A., Baltimore meeting, 1930.

inner wall of the tube with a glass rod, and then using the crystals thus formed to seed the bulk of the preparation. The large portion crystallized slowly and an additional 200 cc. of alcohol were added. This was then cooled thoroughly in ice for several hours and the precipitate recovered on a Buechner funnel, washed with alcohol and air-dried. The white, microcrystalline solid was readily water soluble and weighed 6.5 Gm., a yield of 80%.

Analysis of the sodium salt: $C_7H_7O_5N_2AsNa$, 4.5 H_2O.
Calculated: Nitrogen—6.99%, arsenic—23.42%.
Found: Nitrogen—7.10%, arsenic—23.26%.

Arsenic was determined by the Ewins Method and Nitrogen by the Kjeldahl Method.

The 3-carbamido-4-hydroxy phenyl arsonic acid was compared to Stovarsol for toxicity by intravenous injection of solutions of the sodium salts and found to be more toxic.

TABLE I.—COMPARATIVE TOXICITIES OF STOVARSOL AND 3-CARBAMIDO-4-HYDROXYPHENYLARSONIC ACID.

Drug.	Dosage in mg. per Kg. body weight.	No. rats injected.	No. rats survived.	No. rats died.
Stovarsol	800	3	0	3
	400	3	0	3
	300	3	3	0
	250	3	1	2
	200	3	3	0
3-Carbamido-4-hydroxy-phenylarsonic acid	800	3	0	3
	400	3	0	3
	200	3	0	3
	150	3	0	3
	100	3	3	0

From these results the minimal lethal dose of Stovarsol appears to be between 200 and 250 mg. per Kg. of body weight whereas that of 3-carbamido-4-hydroxy-phenylarsonic acid is between 100 and 150 mg. per Kg. body weight. It is apparent that 3-carbamido-4-hydroxyphenylarsonic acid is about twice as toxic as 3-acetamino-4-hydroxyphenylarsonic acid, Stovarsol. In this instance, at least, the relation between toxicity and chemical structure in arsenic compounds is not analogous to that in antimony compounds when the nature of the side-chain attached to the amino group is used as the basis of comparison.

On the basis of these results we may conclude that 3-carbamido-4-hydroxy-phenylarsonic acid is of no therapeutic value as it is too toxic for clinical use.

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(1) Brahmachari, *Indian Jour. Med. Research*, 10 (1922), 508; *Ibid.*, 12 (1924), 423.
(2) Ehrlich and Bertheim, U. S. Patent, No. 1,077,462.

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TOXICITY OF COLLOIDAL IODINE.*

BY WILLIAM NYIRI AND LOUIS DUBOIS.

The importance of Iodine has long been recognized by the biologist and the physician. As a bio-element iodine is indispensable for the life of the vertebrates and is very largely used in almost all branches of medicine. Its use in therapeutics, although merely built upon empiricism is based upon its alterative, resorptive and probably chemo-therapeutic properties (1). It is highly esteemed as an efficient germicide and antiseptic in human and veterinary medicine. Lately it became valuable for X-ray examination as contrast medium.

For these various purposes iodine is being used in many forms and preparations. There is, however, considerable discrepancy of opinion as to the value of the individual preparation. In accordance with the present assumption the elementary atom of iodine is the ultimate effective agent. The objection made in literature to most of the iodine compounds is that the iodine is too firmly bound within the molecular structure to become effective. Therefore, the general tendency in its therapeutic use, with few exceptions, is to introduce the iodine into the body in forms in which it is easily liberated. These views prompted the physician to try preparations, *e. g.*, Mirion (2) and Pregl's solution (3). For the same reason many physicians prefer free iodine in the well-known forms of Tincture of Iodine and Lugol's solution. These latter preparations, however, although being generally used, have the disadvantage of containing alcohol and iodides, respectively.

It was, therefore, of considerable interest, that Chandler (4), in 1925 succeeded in producing a rather stable suspensoid of iodine which does not contain iodides and alcohol. This "colloidal Iodine" is prepared by the acidification at 0° C. of sodium iodohypoiodite containing Acacia as protective colloid. It contains free iodine in an extremely finely divided form capable of remaining in suspension in water for a considerable length of time. It can be prepared in suspensions of any concentration and preserves its properties even when evaporated to a dry form. When either the emulsion or the powder is added to water the iodine goes into solution rapidly and forms a saturated solution of iodine in water. A saturated aqueous solution of iodine ordinarily requires several days for formation from crystalline iodine, owing to the slight solubility of iodine. (0.034% at 25.°) With the emulsoid, the production of a saturated solution is almost instantaneous. The excess of iodine beyond the saturation point remains in suspension in the original state of colloidal iodine, thus representing a depot from which iodine readily goes into solution whenever additional water is available or to replace iodine which has been removed from the aqueous phase through evaporation or chemical combination. The advantage of this feature may be demonstrated by applying colloidal iodine in high concentration or in powder form to the skin or wound. Only that portion of the iodine which goes into solution through the presence of moisture or added water will be active, while the rest remains inactive, forming a depot and thus being largely free of irritating action. As soon, however, as the dissolved iodine is resorbed, evaporated or has chemically combined, more colloidal iodine goes into solution from the colloidal depot, becoming active, and thus replacing the used or

* From the Research Laboratories of the New Jersey College of Pharmacy, Rutgers University.

lost free iodine. From the chemical standpoint it is interesting that the iodine content of the suspension may always be titrated as readily as any aqueous or alcoholic iodine solution, so that the strength may be readily established.

The mentioned properties of the new colloidal iodine preparation render it promising for therapeutic purposes, provided that the toxicity is not excessive. As a basis for future therapeutic use we undertook a series of investigations as to the toxicity of colloidal iodine comparing it with Tincture of Iodine U. S. P. This comparison was carried out by means of intravenous injections as well as oral administration. In the following we present, briefly, the results of these investigations, and include the record of the experiments.

Rabbits weighing 1.5 to 2.5 Kg. received tincture of iodine and colloidal iodine in 1 and 2.5% solution intravenously, most of them in single doses, some at repeated administration in twenty-four hour intervals. Rabbits to which the preparations were administered by mouth by means of the stomach tube have been autopsied in order to determine the local corrosive action of the iodine on the stomach. The experiments show that with intravenous administration *ceteris paribus* tincture of iodine and colloidal iodine have the same fatal dose. With slow intravenous infusion continued until death occurs at a rate of about 10 mg. per minute about 90 mg. iodine per Kg. animal are fatal. When the intravenous injection is made rapidly, introducing the entire intended amount within a minute, about 40 mg. of iodine per Kg. kill the animal within approximately one-half an hour while 20 mg. may be administered similarly on several successive days until death occurs. Five mg. iodine per Kg. with the same rapid application is tolerated at repeated administration for at least five days. It is difficult to continue these latter experiments for a longer period of time on the same rabbit because of the local irritating action of iodine which manifests itself in form of an extended succulent edema of the rabbit's ear as well as thrombosis and obliteration of the veins. With the repeated administration of the higher doses the rabbits have loose bowel movements, stop eating and die in a cachectic way. Although there are considerable differences in the individual reaction of the animals as we generally observe in biology, we may say that iodine, applied intravenously, has the same toxicity whether used in the form of colloidal iodine or tincture of iodine.[1]

The results of our experiments comparing colloidal iodine and tincture of iodine with *oral* administration are entirely different. Iodine in colloidal form is tolerated in 4–5 times higher doses than is the tincture. The tincture causes death within two hours after the oral introduction of 250 mg. iodine per Kg. rabbit in 2.5% solution. The corresponding effect is obtained after administration of 1250–1500 mg. colloidal iodine per Kg. in 5% solution. While 250 mg. iodine per Kg in form of the tincture makes an extended necrosis of the mucous membrane of the stomach the same amount of colloidal iodine applied under the same working condidions does not show any local corrosive or even irritating effect on the stomach. The two enclosed photographs illustrate these conditions. The stomach of the rabbit which received tincture of iodine has been obtained immediately after death

[1] The potassium iodide content of Tincture of Iodine U. S. P. does not seem to influence the outcome of these experiments. It may be calculated that even immediately after the injection, when the entire amount of tincture of iodine is still in the blood, the potassium level of the blood is maximally twice the normal.

of the animal, which occurred two hours after the administration of the drug (Experiment No. 30). The rabbit which received colloidal iodine behaved normally and was killed twenty hours after administration in order to obtain the stomach (Experiment No. 20). Only 1000 mg. of colloidal iodine per Kg. kill the animal 48 hours after administration and cause necrotic spots in the stomach.

According to the literature colloidal iodine, so far, has been very successfully and extensively used for the control of intestinal parasites, particularly in poultry (Chandler) (5). It seems that in very extended experiments, 0.6 Gm. of iodine in 2% suspension is for adult birds, very well tolerated and has no injurious effect. Chandler (6) also made a few experiments to treat dermatomycoses in human beings apparently with very encouraging results. In minor surgery this preparation is being introduced at present also.

Our toxicity experiments show that colloidal iodine, although similar in its systemic effect to tincture of iodine when administered intravenously, has a very

Fig. 1.—*Iodine Tincture*—150 mg. per Kg. rabbit by mouth.

Fig. 2.—*Iodine Suspensoid*—250 mg. per Kg. rabbit by mouth.

much less corrosive action locally when introduced directly into the stomach. Its remarkable properties compared with other forms and preparations of iodine render it promising for the different branches of therapeutics.

RECORD OF EXPERIMENTS.

I. Intravenous injections (slow rate).

(*a*) Colloidal Iodine (Chandler).[1]

(1) 1.95 Kg. rabbit, Pernocton anæsthesia, used 8 cc. of 2.5% Iodine with uniform speed (ear vein) = 102 mg. I per Kg. Death in 9 minutes.

(2) 2.00 Kg. rabbit, Pernocton anæsthesia, used 6.8 cc. of 2.5% Iodine (jugular vein) = 85 mg. I per Kg. Death in 13 minutes.

(3) 1.40 Kg. rabbit, Pernocton anæsthesia, used 12.6 cc. of 1% Iodine (jugular vein) = 90 mg. I per Kg. Death in 20 minutes.

Average: 92 mg. Iodine per Kg. rabbit.

(*b*) Tincture of Iodine U. S. P.

(4) 1.85 Kg. rabbit, Pernocton anæsthesia, used 7 cc. of 2.5% Iodine with uniform speed (ear vein) = 94 mg. I per Kg. Death in 7 minutes.

[1] We extend our thanks to Riedel-De Haen, Inc., New York, who kindly supplied us with the Pernocton ampuls.

(5) 1.60 Kg. rabbit, Pernocton anæsthesia, used 5.3 cc. of 2.5% Iodine (jugular vein) = 83 mg. per Kg. Death in 8 minutes.

(6) 1.65 Kg. rabbit, Pernocton anæsthesia, used 15.4 cc. of 1% Iodine (jugular vein) = 93 mg. I per Kg. Death in 24 minutes.

Average: 90 mg. Iodine per Kg. rabbit.

II. Intravenous injections (rapid rate, repeated). Injection fluid containing 2% Iodine, all injections in ear vein.

(*a*) Colloidal Iodine (Chandler).

(7) 1.80 Kg. rabbit, used 5.4 cc. (corresponding 60 mg. Iodine per Kg. rabbit). Death 45 minutes later.

(8) 1.40 Kg. rabbit, used 2.8 cc. (40 mg. Iodine per Kg.). Death 30 minutes later.

(9) 2.05 Kg. rabbit, used 3.1 cc. (30 mg. Iodine per Kg.). Death 60 minutes later.

(10) 1.60 Kg. rabbit, June 16th, 2.4 cc. (30 mg. Iodine per Kg.), June 17th, injection repeated. Death 30 minutes later.

(11) 1.55 Kg. rabbit, June 14th, 1.55 cc. (20 mg. Iodine per Kg.). June 15th, repeated, June 16th, repeated. Death 60 minutes later.

(12) 1.60 Kg. rabbit, June 18th, 0.8 cc. (10 mg. Iodine per Kg.), June 19th, repeated. Death three days later.

(13) 2.00 Kg. rabbit, June 18th, 0.5 cc. (5 mg. Iodine per Kg.), June 19th, repeated, June 20th, repeated, June 21st, repeated, June 22nd, repeated. No more injections made because of the extended succulent œdema of the ears, thrombosis and obliteration of the veins.

(*b*) Tincture of Iodine U. S. P.

(14) 1.85 Kg. rabbit, 5.55 cc. (60 mg. Iodine per Kg.). Death 10 minutes later.

(15) 1.80 Kg. rabbit, 3.6 cc. (40 mg. Iodine per Kg.). Death 25 minutes.

(16) 1.55 Kg. rabbit June 15th, 2.3 cc. (30 mg. Iodine per Kg.), June 16th repeated. Death 24 hours later.

(17) 1.65 Kg. rabbit, June 14th, 1.65 cc. (20 mg. Iodine per Kg.), June 15th, repeated; June 16, repeated; June 17th, repeated. Death during the night following last injection.

(18) 1.55 Kg. rabbit, June 18th, 0.78 cc. (10 mg. Iodine per Kg.), June 19th, repeated. Death during the following night.

(19) 1.80 Kg. rabbit, June 18th, 0.45 cc. (5 mg. Iodine per Kg.), June 19th, repeated; June 20th repeated; June 21st repeated; June 22nd repeated. Injections stopped because of extended succulent œdema of ears, thrombosis and obliteration of veins. (Same effect as in Experiment No. 13.)

III. Oral administration (through stomach tube).

(*a*) Colloidal Iodine (Chandler).

(20) 2.00 Kg. rabbit, 20 cc. of 2.5% Iodine (250 mg. Iodine per Kg.) remains healthy. Killed 20 hours later, mucous membrane of stomach normal (see photograph).

(21) 1.60 Kg. rabbit, 16 cc. of 2.5% Iodine (250 mg. Iodine per Kg.) remains healthy.

(22) 1.75 Kg. rabbit, 17.5 cc. of 2.5% Iodine (250 mg. Iodine per Kg.) remains healthy.

(23) 1.65 Kg. rabbit, 16.5 cc. of 2.5% Iodine (250 mg. Iodine per Kg.) remains healthy. Twenty-four hours later dose repeated. Death twenty hours later. Autopsy: Almost no changes in mucous membrane of stomach.

(24) 2.10 Kg. rabbit, 42 cc. of 2.5% Iodine (500 mg. Iodine per Kg.) remains healthy.

(25) 1.75 Kg. rabbit, 35 cc. of 2.5% Iodine (500 mg. Iodine per Kg.) remains healthy. Twenty-four hours later dose repeated. Death eighteen hours later.

(26) 2.30 Kg. rabbit, 69 cc. of 2.5% Iodine (750 mg. Iodine per Kg.) sick impression for twenty-four hours; no food intake during this time; then healthy.

(27) 1.85 Kg. rabbit, 37 cc. of 5% Iodine (1000 mg. Iodine per Kg.) death forty-eight hours later. Autopsy: Brown and black spots of necrosis on cardial half of stomach mucosa.

(28) 1.70 Kg. rabbit, 42.5 cc. of 5% Iodine (1250 mg. Iodine per Kg.). Death twenty-six hours later. Autopsy: Black spots of necrosis of the stomach mucosa.

(29) 1.80 Kg. rabbit, 54 cc. of 5% Iodine (1500 mg. Iodine per Kg.). Death twenty-five minutes later. Autopsy: Stomach mucosa necrotic, stomach brittle, tears when cut out.

(*b*) Tincture of Iodine U. S. P.

(30) 1.85 Kg. rabbit 18.5 cc. of 2.5% Iodine (250 mg. Iodine per Kg.). Death two hours later. Autopsy: Extended necrosis of stomach mucosa (see photograph).

(31) 2.05 Kg. rabbit, 20.5 cc. of 2.5% Iodine (250 mg. Iodine per Kg.). Death two and one-half hours later. Autopsy: Large spots of necrosis of stomach mucosa.

(32) 1.60 Kg. rabbit, 16.0 cc. of 2.5% Iodine (250 mg. Iodine per Kg.). Death one hour later. Autopsy: Extended necrosis of stomach mucosa.

(33) 1.75 Kg. rabbit, 35 cc. of 2.5% Iodine (500 mg. Iodine per Kg.). Death fifteen minutes later. Autopsy: Brittle necrotic stomach; tears when cut out.

SUMMARY.

The paper deals with experimental investigations concerning the toxicity of colloidal iodine (Chandler) particularly in comparison to that of tincture of iodine, U. S. P. It is shown by experiments on rabbits that colloidal iodine and tincture of iodine have the same fatal dose with intravenous administration. This conclusion is based on slow, rapid and repeated injections.

Colloidal iodine has one-fourth to one-sixth of the local corrosive action on the mucous membrane of the stomach exhibited by Tincture of Iodine U. S P. 250 mg. of iodine introduced by means of the stomach tube as tincture, causes an extensive necrosis of the stomach mucosa and is fatal to the animal within approximately 2 hours, while 1000–1500 mg. of iodine in colloidal suspension, similarly administered, has the same injurious effect.

Therefore, from the toxicological standpoint, colloidal iodine appears to be promising for therapeutic use.

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IODINE RETENTION AND DISTRIBUTION IN RABBITS.

BY WILLIAM A. PEABODY.

This study was undertaken to compare quantitatively the retention and particularly, the corresponding distribution of tissue iodine after *continued* inorganic and organic iodide feeding.

The biological advantage of numerous organic iodine preparations over inorganic iodides often has been demonstrated during the past 25 years. Loeb (1), finding that organic iodide but not potassium iodide tended to accumulate in fatty and lipoidal tissues of rabbits, developed his "Lipotropie" theory. Boruttau (2), however, found iodine in brain after potassium iodide administration; likewise McLean (3), though the increase was much greater after iodized soap. Nardelli (4) found pyroiodone to have greater affinity than inorganic iodide for brain tissue. Abderhalden and Kautzsch (5), feeding dogs; Herzfeld and Haupt (6) with normal men; and Pfeiffer (7), and Klein *et al.* (8), studying thyroid utilization of iodine in dogs, observed better retention with organic iodine. Filippi (9) and Bröking (10) using injections; McLean (3); Zuckmayer (11); and Scharrer and Schwaibold (12), who fed cows and determined the iodine content of the milk, noticed in addition that some (or all) of the iodized proteins studied behaved more like inorganic iodides. The data of Hesse (13), who used increased urinary nitrogen in dogs as a measure of effectiveness after fairly large oral dosages of NaI and organic iodine, show slightly greater effects from some of the latter, with lipoiodin giving a lower but more prolonged increase. The compounds monoiodoisovalerylurea and iododioxyhydropropane proved highly toxic. Jacoby (14) concluded that the Ca salts of certain iodized fatty acids are markedly lipotropic, but that the acids themselves are not.

Iodine Distribution.—The I content of normal rabbits according to Maurer and Ducrue (15) ranges from 3γ % (γ % = 0.001 mg./100 Gm.) for fat, brain 8, lung 9, liver 14, kidney and heart 20, blood 30, bile 40, up to spleen 70, uterus 100, ovary 700 and thyroid 15,800γ %. Baldauf and Pincussen (16) give only 10.9γ % for normal human blood. Reported high values for ovary of the cow were not confirmed by Leitch (Cruickshank), and Cruickshank (17) also found low amounts in fowl ovary. Buchholz (18) detected iodine in all human organs examined, with "fairly large" amounts in adrenals, ovaries, thymus and sometimes the spleen. Sturm and Buchholz (19) reported iodine higher in endocrine organs, human testicles and pancreas, with $^1/_2$–$^2/_3$ of the total in the muscle, $^1/_5$–$^1/_{10}$ in the thyroids. After potassium iodide injection in rabbits McLean (20) found fresh liver to contain as much as 22.8 mg. per cent iodine, part of which appeared in the lipoid fraction; feeding potassium iodide or iodized protein (3) produced relatively greater increase in blood and kidney I than did sajodin. Lesser (21) after feeding rabbits iodized fat and analyzing extracted fat, found greatest concentration of iodine and iodized fat in lung extract. Maurer and Ducrue (15) fed small amounts of inorganic iodine to rabbits, with accumulation especially in skin, lungs and kidneys, most of which excess had disappeared after 96 hours; in human blood, the level returned to normal after 24 hours, but in rabbits and sheep lasted 6–11 days. H. Labbe *et al.* (22) stated that injected iodine showed great affinity for lymphoid tissue, especially spleen and ganglia, with liver next. Valenti (23) noted iodine accumulation

in liver and nervous tissue after iodized chaulmoogra oil fed to rabbits. Ishikawa (24) observed as much as fifty-fold increase in spinal-fluid iodine after 1 Gm. potassium iodide ingestion by man (normal 1.2γ %). Lustig and Botstiber (25) concluded that the serum proteins also are a storage place for iodine. Von Fellenberg's (26) fed guinea pigs retained iodine longer in skin, hair and especially muscle. Scharrer (27) after feeding alkali iodides to pigs, found little increase in lungs, muscle, heart and body fat, but large differences in spleen, liver and kidneys.

Elimination.—Maruno (28) noted that rabbits excrete injected organic halogen compounds in the bile more actively than inorganic, but excretion was slight after oral administration. Fricker (29), who fed 1 Gm. of lithium iodide to a man with a biliary fistula, found maximum biliary iodine excretion in 3 hours and 86% elimination in 24 hours. However, the likelihood of reabsorption normally must be considered in connection with biliary excretion. Since fecal and urinary elimination are reviewed extensively in McLean's (3) paper, the question need not be discussed in detail here. The partial dependence of path and rate of excretion upon intermediary metabolism and the specific nature of the latter render the consideration of elimination an individual problem for each compound. The different preparations seem to exhibit wide variations with respect to the extent of I split off in digestion, or subsequently, and the forms in which the I is excreted.

From the foregoing work it may be concluded that the diffusible or loosely-bound iodine of inorganic salts and certain iodized organic compounds is less readily retained for utilization than the more firmly united iodine of iodized soaps, fats or other fatty acid esters, which are more slowly and evenly metabolized. As to distribution within the organism of administered iodine, apparently, as might be expected, the results depend upon a number of factors, such as, the form in which the element is administered, mode of introduction, dosage, duration of administration, species or variety of animal used, normal or pathological state of animal and metabolic or individual differences interrelated with the foregoing. Certainly the concentration of iodine in most if not all tissues can be maintained far above ordinary levels by repeated moderate dosages of almost any absorbable iodine compound.

EXPERIMENTAL.

Pairs of rabbits of the same breed and nearly the same weight, selected without regard to sex, were kept (individually) in metabolism cages. Diet consisted of whole oats and water *ad lib.*, supplemented almost daily with moderate amounts of lettuce, cabbage, beet tops or similar greens, except that animals, 1, 3 and 4 received no greens. In the first three experiments (animals, 1, 3, 4, C-1, C-3 and C-4), the iodized fatty ester or potassium iodide solution was mixed directly with the oats each day. In all subsequent experiments, (indirectly) weighed drops of oil on fresh leaves, and measured volumes of potassium iodide standard solutions dried on the greens, were fed daily, with care to avoid loss, before the bulk of the greenstuff was given. Rabbits 1, 3 and 4 were fed in the spring, the corresponding potassium iodide group C-1, C-3 and C-4 in the summer. As circumstances prevented termination of the first 3 feedings within 2 weeks as originally intended, it was decided to continue until rabbit 1 had consumed one 10-Gm. bottle of oil, and rabbits 2 and 3, one bottle jointly. In all other experiments, feeding was conducted daily at different levels of iodine intake (constant for the experiment, disregarding

change in weight of the animal) for 9 days. At the end of the iodine feeding, the animals were kept on the basal diet for 1–4 days additional, after which they were killed by a blow on the neck, bled from the carotid artery and dissected. Tissues were dried in the oven at 100–110° C. for 24 hours. Urine and feces (with waste food) were collected for the total feeding and after period; the solids were partly dried if necessary, weighed, ground, mixed and sampled.

For iodine analysis the procedure of Leitch and Henderson (30) was followed essentially. Although tedious and requiring an exacting technique, the method is recommended by its potential delicacy and the fact that it requires no special apparatus with the possible exception of micro-pipettes and all-nickel crucibles (it was found possible, in fact preferable, to eliminate the electric furnace by heating the crucible inside a second discarded crucible of the same size over a Fisher burner). Solid samples, usually 0.5 Gm., were mixed with 5 cc. of 10% NaOH solution for decomposition and ashing. With urine, samples of 0.5–2 cc. were treated with 0.2–1.0 cc. of caustic; it was found better to omit alcohol extraction in urinalysis, substituting an additional evaporation and ignition if necessary. For analysis of iodized oil, best results were obtained by dissolving a weighed drop of the well-mixed oil in 50 cc. of acetone-alcohol, and treating 1-cc. samples as in urinalysis. By keeping 0.2-, 1- and 5-cc. graduated pipettes at hand, the entire range of iodine concentrations encountered in oil, tissue and excreta analysis could be accommodated, using $N/500$ thiosulphate and sample sizes as indicated.

DISCUSSION OF RESULTS.

The essential data are recorded in the table. Excepting the single analyses recorded for samples of limited size, each reported value is an average of at least two analyses which checked as closely as the nature or amount of the available sample permitted. In Experiment 1, excreta were not collected; these values are omitted for Experiment 3 because of probable loss in collection. Figures for urine and feces are reported together, since a perfect separation was not sought experimentally. The original data shows urinary iodine to be greater, often many times so, for all animals except those of Experiment 6, which received the highest I dosage and eliminated somewhat more in feces than in urine.

A small but consistent advantage in I retention is evident for the organic form of administration, omitting Experiment 4, in which the excessive loss of weight by rabbit 4 renders the per kilo dosage too unequal for a fair comparison. (It should be rembered that rabbit 4 received no green food during the experiment; it is likely that avitaminosis developed in animals 1, 3 and 4.) The lowest dosages used in these experiments was about twenty times the minimum effective dose for humans as determined by Thompson *et al.* (31) in basal metabolism studies. After the more marked results in Experiment 5 as compared with 6, it was thought that reducing the dosage might show still greater differences, but such did not prove to be the case; in fact, the absolute retention after either form of iodide seemed to be a function more of the breed of animal than one of dosage, below greatly excessive levels. The excretions in the extra periods of Experiment 7 are relatively low, though the tissue analyses (*e. g.*, Experiment 8) indicate that much extra iodine must have been retained during those periods. Pregnancy in rabbit C-9 did not seem to affect iodine retention in either direction.

The tissue analyses show no consistent differences, when potassium iodide is compared with iodized oil. Increases occur in all, including brain, but any "lipotropic" effect of the organic iodide is not evident under the conditions employed. Mixed subcutaneous and perivisceral fat from the first pair of animals (Experiment 5) sufficiently adipose to justify collection, upon single analysis yielded little I in either case; the duplicate samples were lost during analysis. The relatively high iodine concentrations in liver, lung and kidneys confirm the consensus of previous authors. The few analyses of gall bladder with bile suggest a possible higher I content after organic administration. Values for heart are unusually high after the larger doses of either compound. Apparently the flooding of the organism with excessive amounts of I causes high penetration of the element into most tissues and organs. Of the tissues studied, the skeletal muscle appears to be most resistant to production of extremely high I concentrations, with the exception of depot fat and possibly brain. The accumulation of such large amounts of I did not produce any obvious gross pathology, unless the much higher incidence of liver infection in the salt-fed animals can be attributed to the fed potassium iodide rather than to chance.

SUMMARY.

Repeated moderate to high dosages of potassium iodide or iodized fatty ester fed to rabbits produced:

1. Demonstrably greater retention after the organic form of iodide.
2. Marked increase of iodine in most tissues and organs; but no consistent differences between the two forms of iodide are characteristic of the values obtained for total iodine in the tissues examined.

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THE ANTHELMINTIC PROPERTIES OF PEPO U. S. P. AND CUCURBITA PEPO.*

BY JAMES S. NEELY AND EDWARD D. DAVY.

The unsettled question of the activity of pumpkin seed as a vermifuge led us to investigate more fully the official drug and to examine the flesh of ripe pumpkin.

The method of determining anthelmintic activity was by the use of earthworms as directed by Sollman (28). The apparent effect is first, one of stimulation, then paralysis, the killing time being taken when the worm ceased to move and did not recover when placed in fresh water.

1. THE EXAMINATION OF PEPO.

One pound of dried pumpkin seed was extracted with petroleum ether to remove fixed oil. This was followed by 75% alcohol until one liter of percolate was collected. Distillation of the percolate under reduced pressure gave a syrupy residue which was diluted to 75 cc. with distilled water and filtered with the aid of kieselguhr. This solution was mildly acid to litmus but highly active, killing in eight minutes. Treatment of this active solution with lead subacetate produced a voluminous precipitate. This was filtered and the precipitate suspended in water and treated with hydrogen sulphide, again filtered and the filtrate distilled under re-

* Scientific Section, A. PH. A., Rapid City meeting, 1929.

duced pressure. The product was inactive, indicating that the protein isolated by Grübler (8) with lead and barium has no activity.

The filtrate from the first lead precipitate was treated with hydrogen sulphide, filtered and distilled as before, after which the clear syrupy residue was diluted to the original volume. The killing time was the same as before.

Effect of Fermentation.—The above solution, after removal of lead, was next fermented with yeast until it did not reduce Fehling's solution, then filtered with kieselguhr and the filtrate reduced as before to a syrup. When built to the original volume the solution was neutral to litmus and killed in twenty-five minutes.

2. THE EXAMINATION OF CUCURBITA PEPO.

A ripe, twenty-five pound pumpkin was divided into the seeds, the pulp and the rind.

A. The seeds on removal were ground and macerated in alcohol for several days. They were then extracted with alcohol, the solvent evaporated at a low heat and fixed oil removed with petroleum ether. The residue, a syrup, was dissolved in three times its volume of water, giving a killing time of one hour.

B. The pulp was ground and pressed, yielding two liters of juice having a killing time of forty-five minutes. Since the juice was acid to litmus, a portion was heated with calcium carbonate, just short of boiling and filtered while hot. The killing time remained the same.

One hundred cc. of the juice was treated with 0.2 Gm. of barium hydroxide which, like lead, gives a heavy precipitate. The excess barium in the filtrate was removed by treatment with carbon dioxide and heating to boiling. The filtrate when reduced to the original volume showed no loss of activity. The material precipitated by barium was inactive.

All juice not worked the first day was preserved with 15% alcohol, this being subsequently removed by distilling under reduced pressure. The press cake from the pulp was heated to boiling on a water-bath with three pints of alcohol. Expression yielded one gallon of juice which was evaporated to a syrup. Ether and chloroform did not extract any active material. Alcohol removed active material which, when evaporated to a syrup and taken up in three times its volume of water, killed in five minutes.

This pulp from the above expression was dried and extracted with petroleum ether. This yielded the yellow pigment and a small amount of resin. Extraction was continued with alcohol containing 15% ether. Evaporation of the solvent and subsequent solution of the syrupy residue in three times its volume of water, killed in ten minutes.

C. The rind which carried considerable pulp was ground and heated to boiling with 2 quarts of alcohol. The expressed juice when treated as that from the pulp showed somewhat less activity than the corresponding juice from the pulp. After drying the rind and extracting with petroleum ether, it was extracted with alcohol which yielded additional active material.

D. The active material gave no positive tests with any of the alkaloidal reagents. Dialysis showed that the active material was transferred to the diffusate. Hydrolysis of a solution killing in fifteen minutes, by boiling with dilute sulphuric

acid; and removal with barium carbonate, increased the killing time to forty-five minutes.

Five per cent solutions of glucose, sucrose, levulose and lactose had no effect on earthworms, indicating that sugars are not responsible for the activity. Samples of dried active material which were allowed to stand six months in open beakers lost no activity.

E. Action of Pumpkin Pulp.—1000 cc. of expressed juice was evaporated and some of the dried pulp from B added and evaporation continued to dryness, after which pulp was added to a total of 100 Gm. and thoroughly mixed.

We hereby express our thanks to A. L. Brainard, D. V. M., for testing the vermifuge qualities of this product on dogs. The results follow:

In the first series of dogs no laxative was given and negative results were obtained in every case. Dose, 8 Gm. to 15 Gm. each.

In the second series of eight dogs the dose was the same but was followed by castor oil.

First Dog.—Collie; male; weight, 50 lbs.; age, 10 years. Starved 24 hours then 15 Gm. of dried pulp-juice given, followed by castor oil. Result, 2 round worms.

Second Dog.—Mongrel collie; male; weight, 24 lbs.; age, 2 years. Treated as No. 1. Result, several round worms and two tape worms.

Because of lack of material the six remaining dogs were given smaller doses followed by castor oil with negative results.

These results are by no means conclusive but do show an approximate effective dosage and we hope to continue the work on pumpkin pulp in an effort to isolate the active constituent.

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TWO NEW METHODS FOR PHARMACOLOGICAL COMPARISON OF INSOLUBLE PURGATIVES.*

BY DAVID I. MACHT AND J. BARBA-GOSE (of Barcelona).

INTRODUCTORY.

Although the pharmacodynamics of intestinal movements has been studied by many eminent physiologists and pharmacologists such as Magnus (1), Cannon (2) and others, the methods for quantitative comparative evaluation of laxatives and purgatives at the disposal of the pharmacologist are still very inadequate, particularly in respect to those drugs which are not soluble in water or physiological solutions. When dealing with powerful alkaloids and other active principles readily soluble in water, it is a simple matter to follow their effects either on surviving segments of the intestine or isolated strips of muscle or even on the whole intestinal tract *in situ*. When, however, the investigator wishes to ascertain the action of laxative oils, resins and other insoluble substances, the problem is of a very different nature, and the commonest method of approach has hitherto been to feed the various materials to large animals, which had been previously given a dry diet, and then to note the frequency, the quantity and the consistency of the stools. Such experiments have usually been conducted on dogs, cats and rabbits. Sollmann (3) in his comprehensive Laboratory Guide in Pharmacology, can suggest no better method for comparing purgatives than a personal trial of representative specimens from various groups of laxatives by the students themselves. For economical reasons a number of German investigators after the World War attempted to utilize the white mouse for studying intestinal peristalsis. Thus, Laqueur (4) used the whole length of the excised intestine of the white mouse for demonstrating the effects of a number of active principles, which, however, are not used as purgatives. Führer (5) devised an interesting method of roughly comparing the number of laxatives by feeding them to mice in the form of small pills and, following his work, Loewe and Faure (6) devised a more elaborate method of tracing the passage of ingesta by feeding mice with various laxatives together with small quantities of India ink. The latter method has not been satisfactory in the experience of the present writers but suggested the use of finely divided carbon in the first method to be described.

In connection with a study of the oil of *Ruvettus pretiosus*, or "castor-oil fish," the present authors began an extensive investigation on the comparative laxative

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effects of various oils and a number of synthetic chemically pure insoluble compounds, for which all the methods previously employed in the comparative study of laxatives were found to be unsuitable (7). The problem was to devise a practical method by which various oils and other insoluble liquids or solids could be quantitatively compared in respect to their purgative action on animals and, furthermore, in view of the great scarcity of certain synthetic chemical compounds of which not more than one or two cubic centimeters were available, to devise a micropharmacological method in which even very small quantities of the material could be used to advantage, yielding definite and quantitative pharmacodynamic results. After numerous futile attempts, the authors finally succeeded in elaborating two procedures which proved to be quite satisfactory for such purposes. One of these utilizes the animals as a whole while the other involves the employment of isolated surviving loops of the intestine.

THE FIRST METHOD.

An excellent method for studying the effect of purgatives on intact animals can be carried out on white rats. The authors found these animals much more suitable in many respects for such work than white mice. In the white rat the passage of intestinal contents from the pylorus to the rectum usually requires from one and a half to two hours and sometimes even less. Full-grown white rats, of the genus *Mus norvegicus*, have been used by the authors exclusively. These animals are first kept for some time in the laboratory and fed on a standard dry diet, the composition of which is as follows:

Wheat—25 grams
Ground maize—25 grams
Rolled oats—28½ grams
Flaxseed meal—10 grams
Casein or whole milk (dried)—10 grams
Sodium chloride—1 gram
Calcium carbonate—0.5 gram.

Before a series of experiments, a number of rats are selected and allowed to fast from fifteen to twenty hours so as to have the stomach and small intestine free from food. In order to determine the time required for passage of ingesta through the intestinal tract, a number of the animals are given by "stomach tube" a specially prepared emulsion containing finely divided animal charcoal. An assistant holds the animal wrapped in a towel; its jaws are pried open with a pair of forceps; and the experimenter introduces the tube into the stomach. The "stomach tube" consists of the distal portion of such a fine silk ureteral catheter as is employed for cystoscopy by urologists and gynecologists. The passage of the tube requires considerable experience, and a beginner will often introduce the catheter, or "stomach tube," so clumsily as to produce trauma, pierce the esophageal walls, and injure the lungs. From 0.5 to 1 cc. of a suspension of finely divided charcoal is injected into the stomach through the tube by means of a tuberculin syringe provided with a thick bore needle, which fits snugly into the catheter. With practice the passage of the "stomach tube" and introduction of the suspension can be accomplished very easily without discomfort to the animals. The suspensions which the authors have been using were so prepared as to be thick enough not to flow too readily and

yet thin enough to be injected through the large needle fitting into the catheter. The formula generally employed was as follows:

Tragacanth	2.0 gm.
Purified animal charcoal	12.0 gm.
Water	130.0 cc.

In some cases a small quantity of powdered nutgalls, added to the mixture described above, made an even more satisfactory emulsion.

After introducing the charcoal suspension into the stomach, the time is noted and the animal is placed in a cage and allowed to eat of the ration mentioned above *ad libitum*. At the end of a given period, conveniently, from 40 to 50 minutes, the animal is taken from the cage and killed as quickly as possible with chloroform, care being taken to use a liberal amount of the anesthetic so as to minimize, or eliminate entirely, the stage of excitement. The body is then rapidly opened and the entire

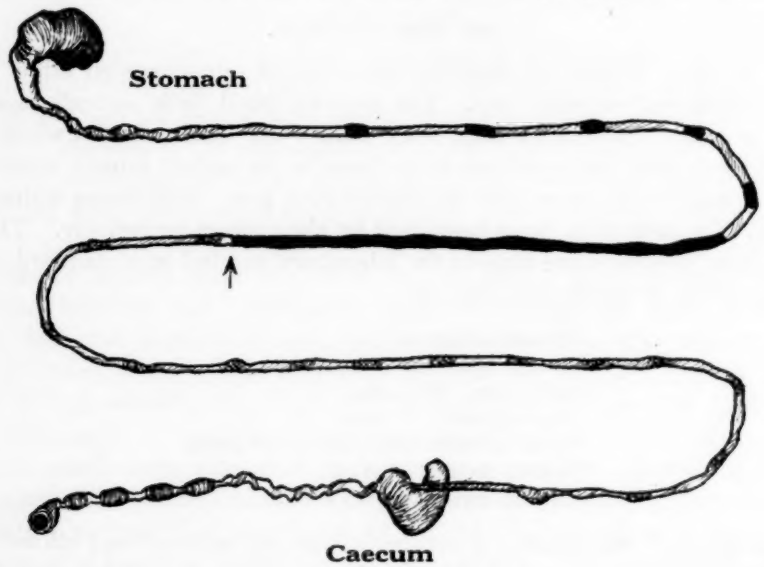

Fig. 1.

gastrointestinal tract, from the esophagus to the anus, is excised and stretched out on a table. The total length of the intestinal tract from the pylorus to the end is measured in centimeters. Examination of the intestine plainly reveals how far the carbon suspension has moved from the time of its introduction into the stomach until the time of death. The carbon particles can be detected by their black color showing through the intestinal walls. The exact position of the small particles, of course, can be more accurately ascertained by making an incision into the lumen of the gut. The distance the carbon particles have traversed from the pylorus is also measured with a centimeter tape and expressed in the form of percentage of the total length of the intestinal canal. Thus, it has been found that the usual distance traversed in fifty minutes by the contents containing carbon particles is from 45 to 50 per cent of the total length of the intestinal tract. The normal time of passage of contents through the intestines having been established, other animals from the same group are selected and given the substance to be tested in a similar way.

Thus, for instance, the effect of castor oil is studied as follows: the stomach tube is introduced by the method described above and 0.5 cc. of the charcoal suspension is injected into the stomach. This is followed by 0.1 cc. of castor oil and the drug is followed again by 0.5 cc. of the carbon suspension. In a similar manner as little as 0.1 cc. of an oil or other insoluble liquid to be tested for its laxative effect can be administered to rats by "sandwiching" it between two doses of the charcoal suspension. This method was found to be preferable to mixing the drug thoroughly with the suspension before injection. It is needless to state that when a number of drugs are studied at the same time in the manner described above, the stomach tube and catheter, syringe and needle must be thoroughly cleansed between the various injections. Figure 1 is a diagramatic illustration of the method employed. It represents the whole greater intestinal tract of a rat. The carbon mixture with food contents is colored black, and the arrow shows the farthest point reached by the carbon suspension at the end of a given period of time. The distance from the pylorus to this point, expressed as a percentage of the total length of the intestinal canal from the pylorus to the anus, gives a numerical index for the speed of passage through the intestines of the particular mixture administered.

The authors have performed a great many experiments by this method and found it exceedingly useful, especially for the comparative study of the laxative effects of various oils and insoluble liquid chemical compounds. Thus, for instance, in connection with an extensive study of the oil from *Ruvettus pretiosus*, or "castor-oil fish," the following comparative figures were obtained, and it will be noted that while olive oil is but very slightly laxative, castor oil and *Ruvettus* oil are very much more so, the latter being of about the same efficiency. It will be further noted that it is the unsaponifiable fraction of *Ruvettus* oil which possesses most of the laxative effect.

TABLE I.

		Average distance traversed (per cent of total length).			Average distance traversed (per cent of total length).
I	Controls	45	IV	*Ruvettus* oil	68
II	Olive oil	55	V	Saponifiable fraction	63
III	Castor oil	70	VI	Unsaponifiable fraction	77

THE SECOND METHOD.

The method usually employed in studying intestinal pharmacodynamics *in vitro* consists of suspending either a segment of live intestine or strips of surviving muscle in physiological saline solution kept at body temperature and oxygenated. The effect of drugs on such preparations is studied by introducing various quantities of the substances into the physiological saline in which the segment is suspended and observing the contractions of the muscle as inscribed by the lever on the kymograph. Such a method is obviously applicable only to the study of drugs or chemicals which are more or less soluble in water or physiological saline solutions, and they are inadequate for the study of oils, resins and other insoluble solids or liquids. The following very simple procedure devised by the authors was found to give valuable information in connection with the study of purgative oils and some related insoluble chemicals. A cat is anesthetized with ether and a laparotomy is performed. A segment of the small intestine, whether it be the ilium or jejunum, is selected and a loop of any desired length is tied off. The mesenteric vessels leading

to the loop are ligated and the segment is excised with the ligatures intact. This closed segment of the intestine is placed in the Locke or Tyrode solution to be used as the material for pharmacological investigation. The intestinal loop is taken out without allowing the Locke solution to penetrate the lumen and a piece of the intestine, one or two inches long, is cut off and one end of this segment is ligated so as to completely occlude the lumen. Into the free and open end of the segment is introduced a specially constructed glass cannula (C), which is presently to be attached to the short arm of a recording lever. The occluded or ligated end of the segment

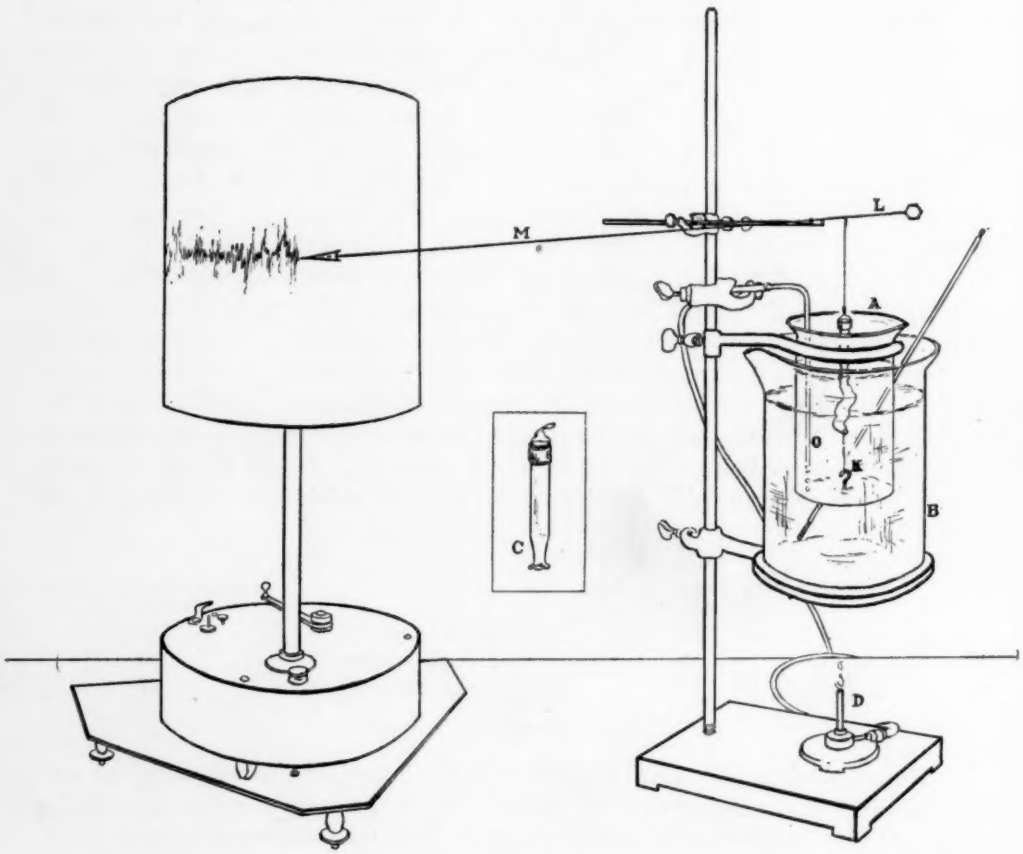

Fig. 2.

is attached to a glass hook (K) fused into the bottom of a glass beaker (A), containing physiological saline oxygenated through a tube (O). The free end of the segment attached to the glass cannula or collar is fastened to the short arm of the lever (L). The collar or cannula is made of such a length that even when the intestinal segment is contracted to a high degree its opening will still be above the level of the physiological saline solution. The chamber (A), containing the preparations thus suspended in oxygenated physiological saline, is kept at a constant temperature being immersed in a water-bath (B) heated by a Bunsen burner (D). The long arm of the level (M) is weighted sufficiently to keep the lever writing in a

horizontal position under normal conditions. In this way, by the use of a very slowly revolving kymograph, the normal contractions of the intestinal segment are first allowed to be recorded for an hour or more. When such a tracing is fairly uniform and level, minute quantities of an oil or other insoluble liquid to be tested are carefully introduced with a fine pipette through the glass cannula into the lumen of the intestinal preparation. If the weight of the drug thus introduced is sufficient to change slightly the level of the long arm of the lever, a counterweight sufficient to offset this is added. The preparation is then allowed to write upon the slowly moving drum at a constant temperature for from one to two hours, or longer. In this way the oil or other insoluble liquid brought in contact with the surface of the intestinal mucus membrane is allowed to be acted upon, if possible, by whatever traces of digestive enzymes may be present in the villi and to be absorbed. As a matter of fact, to the surprise of the experimenters, castor oil and other laxative oils, as well as various insoluble liquid chemicals, after remaining for an hour or two, and sometimes longer, inside the intestinal segment under the conditions described

Fig. 3.—Effect of olive oil, Ruvettus oil and atropine sulphate on segment of cat's jejunum.

above, showed a pharmacodynamic effect, some of them producing stimulation of the contractions, others increasing the tonus of the preparation, and still others having an inhibitory or paralytic action. An illustration of the curves obtained by the method described is shown in Fig. 3. Here we see the relative effects of olive oil, oil of *Ruvettus* and atropine sulphate on two isolated segments of cat's intestine.

COMMENT.

The two methods described above have been employed by the authors especially in studying the oil of *Ruvettus pretiosus*, or the so-called "castor-oil fish," and comparing it with olive oil, castor oil, croton oil, mineral oil and certain other oils. They were furthermore employed for testing small quantities, 0.1 to 0.2 cc., of chemicals obtained by Professor E. Emmet Reid and Dr. Warren M. Cox on fractionating *Ruvettus* oil in order to analyze in greater detail its exact mechanism of action, to be described in a fuller pharmacological study elsewhere. It was found, in general, that the results obtained by both methods completely agreed with each other. These results, obtained by the devices described above,

were also corroborated by roentgenological studies made by the authors on rats with the kind assistance of Dr. M. Ostro, externe in roentgenology, Johns Hopkins Hospital, and roentgenologist, Sinai Hospital, Baltimore. In view of these gratifying results, it is deemed worth while to publish a description of the methods of experimentation for the benefit of those interested in this line of work. While the procedures employed may not be ideal, they were found to be quite adequate, and further investigation along these lines may lead to greater improvements of technique in a domain of pharmacology which has not yet been satisfactorily developed.

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A STATISTICAL STUDY OF THE PHARMACOPŒIAL CONSTANTS OF OLEUM CHENOPODII.*

BY JAMES C. MUNCH AND WILLIAM F. REINDOLLAR.

During the five-year period from 1925 to 1929, inclusive, authentic samples of normal and high-test wormseed oil were collected at the stills. The ascaridol content, specific gravity at $\frac{25°}{25°}$ C., specific rotation, refractive index at 20° C. and solubility in 70% alcohol were determined by the methods of the tenth Pharmacopœia (6). Pertinent data upon thirty-nine samples of normal and seven samples of high-test oil have been subjected to statistical analysis. Because of the difficulty of obtaining authentic oils a larger number of results could not be obtained. A detailed study has been made of the normal oils, but because of limited data less attention has been paid to high-test oils.

The values for ascaridol and the physical constants of the normal oils are given in Table I. The sums of the individual values of each determination have been divided by the number of samples to obtain the "mean." The deviation of each individual value from the mean has been squared. The sum of these squares has been divided by the number of observations to obtain the average of the squares. The square root of this average value is termed the "Standard Deviation." The standard deviation is a statistical measure of the accuracy of a series of determinations, and is expressed in the same order of magnitude as the mean. In order to obtain figures by which comparisons of the accuracy of different determinations may be made the "Coefficient of Variation" is calculated. This is obtained by dividing the standard deviation by the mean and multiplying the quotient by one hundred. In other words it is that per cent of the mean which is represented by the standard deviation. A series of results which differs but slightly from the mean, such as those of specific gravity or refractive index, show small values for

* Scientific Section, A. PH. A., Baltimore meeting, 1930.

the standard deviation and coefficient of variation. In Table I the coefficient of variation for these determinations was less than one, which means that the standard deviation was less than one per cent of the mean. Conversely a series of determinations presenting greater departures from the mean will have a larger standard deviation, as reflected by a larger coefficient of variation.

The "Probable Error" (*PE*) is a statistical measure of accuracy. In general it is two-thirds of the standard deviation. It may be determined by adding all of the deviations from the mean arithmetically (without regard to sign); dividing this sum by the number of observations gives the average deviation and the product of this by the constant 0.8453 gives the *PE*.

The "Correlation Coefficient" (r) measures the degree of co-relationship or the proportionate change in one variable of a pair when the other undergoes successive changes in magnitude. It is an abstract number which ranges from 1.00 (perfect agreement) to 0.00 (no relationship). If one value tends to increase with increasing values of the other, correlation is said to be direct and the sign is positive. If one value decreases as the other increases, correlation is inverse and the sign is negative. Higher degrees of correlation give values more closely approaching unity. However, the correlation coefficient is not a direct measure of the degree of correlation. For instance when $r = 0.90$ the degree of correlation is three times as certain as when $r = 0.60$, and eleven times as certain as when $r = 0.30$. It must be remembered that r is a measure of linear correlation. When relationship is not linear it gives spurious values and other measures of relationship must be used. In order to be significant the correlation coefficient must be greater than three times its probable error. The formula for calculating r is:

$$r = \frac{\Sigma XY}{N\sigma_X\sigma_Y}$$

in which X and Y represent the deviations of each pair of values from their respective means, Σ represents the summation of these values, N the number of pairs of observations, and σx and σy are the standard deviations of X and Y, respectively.

The formula for the Probable Error of r is

$$PE_r = 0.6745\,\frac{1 - r^2}{\sqrt{N}}.$$

Before computing the correlation coefficient a scatter diagram should be constructed. The more accurate series of values, or those in which we have the most confidence, are taken as abscissae, the other series as ordinates. After r has been determined a regression line is fitted to the data by the formula

$$(Y - Y') = r\,\frac{\sigma_Y}{\sigma_X}\,(X - X').$$

The value for r is 0.89, its probable error $\pm$ 0.02 and the equation of the regression line is

$$Y = 0.00092\,X + 0.9076.$$

The correlation coefficient between ascaridol and the physical constants have been consolidated in Table II as well as the correlation between the constants.

TABLE I.—PHARMACOPŒIAL CONSTANTS OF NORMAL OIL OF CHENOPODIUM 1926–1929, INCLUSIVE.

Number.	Ascaridol.	Sp. gr. av. at $\frac{25°}{25°}$.	Sp. rotat. at 25°.	Ref. index at 20°.	Volumes of 70% alcohol for complete solution.
1	64	0.9669	−6.5	1.4751	7
2	67	0.9654	−6.4	1.4749	7
3	63	0.9645	−6.5	1.4748	7
4	66	0.9685	−6.0	1.4749	6
5	72	0.9701	−5.1	1.4752	5
6	78	0.9781	−4.7	1.4749	3
7	71	0.9725	−7.5	1.4736	2
8	75	0.9759	−7.1	1.4735	2
9	64	0.9640	−6.9	1.4732	4
10	74	0.9751	−5.9	1.4738	3
11	71	0.9719	−6.9	1.4738	3
12	77	0.9796	−5.0	1.4741	3
13	65	0.9684	−6.6	1.4739	2
14	63	0.9618	−8.7	1.4740	3
15	79	0.9799	−5.9	1.4737	2
16	66	0.9664	−7.6	1.4734	3
17	58	0.9641	−5.0	1.4750	7
18	55	0.9580	−6.5	1.4749	8
19	63	0.9667	−5.4	1.4745	6
20	63	0.9651	−5.5	1.4750	7
21	70	0.9776	−4.7	1.4746	3
22	68	0.9728	−5.0	1.4746	3
23	61	0.9665	−5.6	1.4752	3
24	74	0.9759	−5.3	1.4747	2
25	71	0.9725	−5.4	1.4745	2
26	63	0.9617	−6.8	1.4749	3
27	76	0.9792	−5.0	1.4745	2
28	67	0.9746	−4.6	1.4747	2
29	66	0.9724	−4.8	1.4745	2
30	60	0.9616	−6.7	1.4752	5
31	58	0.9593	−6.4	1.4750	6
32	50	0.9549	−6.4	1.4754	9
33	60	0.9622	−7.6	1.4749	5
34	62	0.9715	−5.8	1.4747	3
35	67	0.9629	−7.6	1.4753	4
36	56	0.9510	−8.2	1.4752	8
37	64	0.9748	−5.5	1.4744	3
38	73	0.9749	−4.4	1.4750	3
39	76	0.9765	−5.9	1.4748	2
Sum	2596	37.7857	−237.4	57.5083	160
Mean	66.6	0.9689	−6.1	1.4746	4.1
Stand. dev.	6.86	0.0071	1.06	0.00058	2.06
C. V.	10.5	0.73	17.4	0.04	50

Partial correlation coefficients have been calculated between two variables when one, two or three other variables are fixed. The formula for the partial correlation coefficient is

$$r_{ab.c} = \frac{r_{ab} - (r_{ac})\,(r_{bc})}{\sqrt{(1 - r_{ac}^2)\,(1 - r_{bc}^2)}},$$

in which the various subscripts represent the pairs of variables compared. After the partial correlation coefficients have been calculated in which one variable is fixed, an extention of this formula is used for the fixation of two or more variables.

TABLE II.—CORRELATION COEFFICIENTS FOR ASSAYS OF OIL OF CHENOPODIUM.

	P.E.
1.	
Ascaridol/SpGr	0.89±0.02
Asc:Gr/Rot	0.89
Asc:Gr/nD	0.87
Asc:Gr/Alc	0.76
Asc:Gr/Rot, nD	0.85
Asc:Gr/Rot, Alc	0.80
Asc:Gr/nD, Alc	0.77
Asc:Gr/Rot, nD, Alc	0.79
2.	
Ascaridol/Rot	−0.38±0.09
Asc:Rot/Gr	+0.42
Asc:Rot/nD	−0.59
Asc:Rot/Alc	−0.33
3.	
Ascaridol/nD	−0.40±0.09
Asc:nD/Gr	−0.06
Asc:nD/Rot	−0.53
Asc:nD/Alc	+0.02
4.	
Ascaridol/Alc	−0.73±0.05
Asc:Alc/Gr	−0.23
Asc:Alc/Rot	−0.66
Asc:Alc/nD	−0.66
Asc:Alc/Rot, nD	−0.50
5.	
	P.E.
SpGr/Rot	−0.60±0.07
6.	
SpGr/nD	−0.42±0.09
SpGr:nD/Rot	−0.69
7.	
SpGr/Alc	−0.74±0.05
SpGr:Alc/Asc	−0.29
SpGr:Alc/Rot	−0.77
SpGr:Alc/nD	−0.67
SpGr:Alc/Rot, nD	−0.61
8.	
Rot/nD	−0.21±0.11
9.	
Rot/Alc	+0.23±0.11
10.	
nD/Alc	0.56±0.07
nD:Alc/Rot	0.61

Asc represents ascaridol. nD represents index of refraction.
SpGr or Gr represents specific gravity. Alc represents alcohol.
Rot represents rotation.

The correlation coefficient between ascaridol and specific gravity was found to be 0.89. When the rotation or the refractive index was fixed no significant change in r was produced. When, however, the alcohol solubility was fixed the value decreased to 0.76. This is interpreted to mean that the alcohol solubility influenced the ascaridol: specific gravity correlation. Since the correlation coefficient of ascaridol to alcohol solubility was −0.73 and the correlation of specific gravity to alcohol solubility was −0.74, it is not possible to determine which interrelationship is responsible for the decrease in the partial correlation coefficient. Fixation of the rotation and the index of refraction, as well as the alcohol solubility, failed to cause any further change. This is interpreted as further confirmation of the inter-relationship of ascaridol and specific gravity but not of the other variables.

A number of other partial correlation coefficients were calculated without revealing more significant relationships. It is interesting to note that there is a

significant inverse relationship between ascaridol and alcohol solubility ($r = -0.73 \pm 0.05$).

In studies on high-test oil the correlation coefficient for ascaridol to specific gravity was 0.85 ± 0.07. Because of insufficient data further correlation coefficients were not determined.

Calculations of the correlation coefficients and partial correlation coefficients have been greatly simplified by the use of approximation formulas and tables developed in the course of this type of statistical research (1, 2, 3, 4, 5, 6, 7, 8).

CONCLUSIONS.

(*a*) Ascaridol shows a significant direct relationship to specific gravity ($r = 0.89 \pm 0.02$) and inverse relationship to alcohol solubility ($r = -0.73 \pm 0.05$).

(*b*) These relationships are confirmed by partial correlation coefficients.

(*c*) The other variables show no significant relationship.

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HYDROLYSIS OF ACETYLSALICYLIC ACID IN ETHANOL, GLYCEROL AND ETHANOL-GLYCEROL SOLUTIONS.*

BY FREDERICK G. GERMUTH.[1]

INTRODUCTION.

Conversion of the acetic acid ester of salicylic acid into its components in aqueous solution by the hydrolytic action of the solvent occurs with comparative rapidity. In the effort to prevent this disintegration when it is desired to dispense the analgesic in solution form it has been suggested (1) that the compound be dissolved in a menstruum consisting of portions of ethyl alcohol and glycerol. It is evident, however, since the U. S. P. grade of the latter rarely contains more than 95 per cent of the tri-hydric alcohol, while ethanol of the same quality contains a similar proportion of water—that hydrolysis cannot be entirely suppressed by the employment of these vehicles. It seemed desirable to learn to what extent the phenomenon would be induced by varying the water content of ethanol and glycerol

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and mixtures of the two liquids to which definite quantities of water were added, and which were maintained at room temperatures.

ACTION OF MEDICINAL.

While the present work deals primarily with the hydrolytic action and subsequent effect of varying concentrations of water on solutions of acetylsalicylic acid in compounds of alcoholic structure, it may not be amiss to summarize some of the more important therapeutic properties of the ester, most of which undergo partial or complete change when disintegration of the type under consideration obtains, and acetylsalicylic acid, as such, no longer exists in its entirety.

The substance is known to exert a more powerful central depression than sodium salicylate because of the presence of the acetyl group. For this reason it is extensively prescribed by the physician and employed by the laity as an analgesic, for the relief of the various types of headache and neuralgia, and as an hypnotic. The action of this drug is similar to that produced by the administration of small doses of ethyl alcohol, or of the barbitals or bromides. In definitely effective, but not paralytic, doses the effects are characterized by removal of central nervous inhibition, thus causing abolition of pain and distress with general excitation and increased heart rate, and related symptoms; in short, the typical effect of a narcotic drug.

PURIFICATION OF MATERIALS.

The ethyl alcohol used was the so-called "absolute" grade, 200 proof. Investigation disclosed the fact that this product contained 99.80 per cent C_2H_5OH, with traces of aldehydes but no electrolytes. Further purification and dehydration was deemed essential; the former was accomplished by the method of Paul (2) for the removal of this series of compounds—decreasing the proportion of the lower aldehydes to approximately 0.001 per cent—while dehydration of the requisite character was obtained by the employment of calcium oxide and activated aluminium (3). A product possessing the density value 0.78508 was produced in this manner; the reading was made at 25° C. The alcohol so treated was kept in brown glass bottles tightly stoppered and sealed with collodion so as to exclude air and eliminate moisture absorption. As a further precaution, the containers were stored in a dark room until needed; this procedure inhibiting the re-formation of aldehyde in the solvent.

A grade of glycerol suitable for the experimental portion of the work was produced by resorting to fractional vacuum distillation, using as raw material glycerol of U. S. P. quality. For this purpose a forty-eight-inch Vigreux column, covered with asbestos paper and connected to a Bruehl receiver, was employed. Distillation was carried out under a pressure of 6 to 7 mm. Hg, and the first 30–35 per cent of the product, containing all of the water and other impurities of lower boiling point than glycerol, discarded. The middle portion, up to about 70 per cent of the sample taken consisted of anhydrous glycerol, free from water and trimethylene glycol, and contained but a negligible trace of polyglycerols, chiefly diglycerol ether. The purified compound, possessing a density of 1.261 at 20° C., and the boiling point 289.8° C. (corrected), corresponding to 100 per cent $(CH_2OH)_2CHOH$, was immediately stored in a desiccator over phosphorous pentoxide; suction was then

applied to the container, and the air partially exhausted. The desiccator and its contents were taken to the dark room and kept there until required for use.

The acetylsalicylic acid employed was of U. S. P. grade, and contained but a faint trace of free acid. This product melted sharply at 133.8° C.

METHOD EMPLOYED.

A method based on colorimetric procedure (4) involving the formation of the familiar purplish tint which the ion of tervalent iron produces in the presence of salicylic acid or its salts, was used. Prior to application the method was meticulously examined for the express purpose of ascertaining if it possessed that degree of accuracy and sensitivity essential to the attainment of results concordant with work of experimental character. During the preliminary tests, solutions were prepared containing definite quantities of an extremely pure, natural salicylic acid derived from *Gaultheria procumbens*. It was found that results of a most gratifying character were realized when inspection of the comparatively dilute solutions was made; further investigation, however, evinced the fact that results equally as satisfactory for determining the free salicylic acid in the more concentrated solution—*i. e.*, those in which hydrolysis was most pronounced—were obtainable only when the volume taken for the determination was decreased accordingly, and the addition of ethyl alcohol made. Of course, standards utilized were accorded the same treatment.

Numerous confirmatory tests furnished convincing evidence of the applicability of this method, so modified, to the successful attainment of the work contemplated. Finally, the employment of the Duboscq colorimeter in comparing the intensity of the colorations produced in the experimental samples with those of the color standards greatly facilitated the analytical determinations made.

PROCEDURE.

Test samples of 5 per cent and 10 per cent solutions of the synthetic in aqueous ethanol, glycerol and ethanol-glycerol were prepared. These were immediately placed in special brown glass bottles, sealed and protected from light until examination was made. Special precautions to preserve the solutions in appropriate containers *at once* following preparation were taken and, it is believed, absorption of moisture from atmospheric air that might have occurred during this brief interval was so minute as to be without significance.

After the allotted time had elapsed, the samples were examined and tested for their free salicylic acid content. Great care, too, was exercised during these periods to work with sufficient rapidity to insure the prevention of the introduction of errors due to moisture change and possible contamination by volatile impurities existing in the air of the laboratory.

The following tables furnish data ascertained as a result of many examinations made at varying intervals of time:

Attention is directed to the fact that it had been the intention of the author to consider mixtures of ethanol and glycerol in the proportions: 50% : 50% and 25% : 75%, plus water, as solvents for acetylsalicylic acid. The former mixture was prepared, and is given due consideration here; a few experimental samples of the second series were made and examined, but results were so nearly identical with those first encountered that further examination seemed superfluous.

TABLE I.—ETHANOL SOLUTIONS OF ACETYLSALICYLIC ACID.

Percentage of Compound Undergoing Hydrolysis at 20° to 22° Centigrade.

Composition of solvent. (By volume.)	5% Solution. Age in hours. 24.	72.	120.	240.	10% Solution. Age in hours. 24.	72.	120.	240.
Anhydrous ethanol	None	None	None	Trace	None	None	None	None
Ethanol 99.75 H_2O 0.25	0.8	1.4	3.7	8.3	0.5	0.9	2.2	5.8
Ethanol 99.50 H_2O 0.50	1.1	1.5	4.3	10.6	0.8	1.2	3.7	8.8
Ethanol 99.00 H_2O 1.00	1.5	1.9	4.4	11.1	1.0	1.6	4.1	9.7
Ethanol 98.00 H_2O 2.00	1.9	2.7	5.3	12.9	1.4	2.1	4.6	10.5
Ethanol 96.00 H_2O 4.00	3.9	5.1	8.8	16.7	3.2	4.8	8.1	14.9
Ethanol 95.00 H_2O 5.00	5.5	8.0	11.6	19.9	5.4	7.6	10.9	17.9
Ethanol 94.00 H_2O 6.00	5.8	8.7	12.7	20.4	5.5	8.1	11.3	18.0
Ethanol 93.00 H_2O 7.00	6.3	8.6	14.1	22.1	6.1	8.7	13.2	20.8
Ethanol 90.00 H_2O 10.00	10.8	14.8	21.9	39.9	9.6	12.9	19.2	37.4

TABLE II.—GLYCEROL SOLUTIONS OF ACETYLSALICYLIC ACID.

Percentage of Compound Undergoing Hydrolysis at 20° to 22° Centigrade.

Composition of solvent. (By volume.)	5% Solution. Age in hours. 24.	72.	120.	240.	10% Solution. Age in hours. 24.	72.	120.	240.
Anhydrous glycerol	None	None	None	None	None	None	None	None
Glycerol 99.75 H_2O 0.25	0.5	0.9	2.6	5.3	0.4	0.7	2.3	5.1
Glycerol 99.50 H_2O 0.50	1.1	1.8	3.5	7.3	0.8	1.0	3.2	8.1
Glycerol 99.00 H_2O 1.00	1.2	1.8	3.9	9.6	1.0	1.4	3.9	8.9
Glycerol 98.00 H_2O 2.00	1.7	2.4	4.9	11.4	1.4	2.0	4.3	9.8
Glycerol 96.00 H_2O 4.00	3.5	4.7	7.5	14.9	3.1	4.4	7.5	12.9
Glycerol 95.00 H_2O 5.00	5.1	7.3	9.0	17.7	4.8	7.3	9.0	16.1
Glycerol 94.00 H_2O 6.00	5.4	7.9	11.9	19.1	5.1	7.4	11.1	18.3
Glycerol 93.00 H_2O 7.00	6.2	8.6	13.9	21.7	6.1	8.4	12.8	20.3
Glycerol 90.00 H_2O 10.00	9.7	13.9	19.8	34.6	8.3	12.7	19.6	32.4

TABLE III.—ETHANOL-GLYCEROL SOLUTIONS OF ACETYLSALICYLIC ACID.

Percentage of Compound Undergoing Hydrolysis at 20° to 22° Centigrade.

Composition of solvent. (By volume.)	5% Solution. Age in hours. 24.	72.	120.	240.	10% Solution. Age in hours. 24.	72.	120.	240.
Anhydrous mixture C_2H_5OH 50 $C_3H_5(OH)_3$ 50	None	None	None	None	None	None	None	None
Mixture 99.75 H_2O 0.25	0.3	0.5	0.9	2.2	None	Trace	0.7	1.9
Mixture 99.50 H_2O 0.50	0.5	0.9	2.1	3.7	Trace	0.5	1.5	2.8
Mixture 99.00 H_2O 1.00	0.8	1.3	3.2	5.2	0.4	0.7	2.8	4.8
Mixture 98.00 H_2O 2.00	1.1	1.8	4.1	8.0	0.7	1.3	3.5	5.4
Mixture 96.00 H_2O 4.00	2.8	3.9	6.7	10.9	2.2	3.4	6.0	9.7
Mixture 95.00 H_2O 5.00	3.9	5.4	6.9	13.3	3.1	4.9	7.1	12.3
Mixture 94.00 H_2O 6.00	4.1	6.9	8.7	15.1	3.8	6.6	7.9	14.8
Mixture 93.00 H_2O 7.00	5.5	7.2	10.1	17.2	4.9	5.9	9.8	16.1
Mixture 90.00 H_2O 10.00	7.8	10.1	15.2	28.7	6.7	10.0	14.6	24.3

CONCLUSIONS.

It will be observed that, with few exceptions, the results presented in the tables are in strict accord with the accepted fact that dilution favors hydrolysis. It is believed, too, that acceleration of the phenomenon in ethyl alcohol in excess of that observed in glycerol might be at least partially ascribed to a progressive alcoholysis induced by and occurring in the presence of the free hydrogen ions of dissociated acetic acid. A comparison of the constitutions of the two alcohols,

and the differences existing in their degree of physico-chemical activity would seem to warrant this assumption. This explanation, however, fails to account for the retardation of hydrolytic action in solutions of the ester in a mixture of equal parts of ethanol and glycerol. Apparently, the tri-hydric alcohol is capable of exerting, in the presence of ethanol, an inhibitory effect on the rate at which disintegration of the type considered, occurs. It is not improbable that this is induced by certain physical changes in the system, acetylsalicylic acid–ethanol–glycerol, which evidently suppress, to some extent, the tendency of water to dissociate and react with the components of the solute. Assuming that this conclusion is correct, a diminution in hydrolysis might be anticipated.

SUMMARY.

(1) The rate of hydrolysis of acetylsalicylic acid in ethanol, glycerol and mixtures of these compounds of alcoholic structure—to which varying proportions of water were added—has been studied.

(2) While hydrolysis is favored by dilution the addition of water and increasing age of the solution, this phenomenon is accentuated with respect to aqueous solutions of the ester in the primary alcohol.

(3) A mixture of equal parts (by volume) of ethanol and glycerol to which water has been added, does not hydrolize acetylsalicylic acid to the same extent that either, alone, is capable of doing under similar conditions of concentration and temperature.

(4) A possible explanation of this difference in behavior has been suggested.

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MENTHOL CRYSTAL AND PEPPERMINT OIL MARKET AT KOBE, JAPAN.

The combined quantity of menthol crystals and peppermint oil carried over from 1929 was about 80 tons. Total production of both commodities was about 520 tons in Hokkaido and 114 tons in the other islands, giving a total supply of about 714 tons. Of the latter amount, 260 tons of crystals and 256 tons of oil were exported, while loss in weight and domestic consumption accounted for about 100 tons. About 98 tons remained to carry over to 1930.

RESORCINOL IMPORTS DECLINE.

United States imports of resorcinol entered for consumption during the first four months of 1931 amounted to 11,200 pounds, a decline of 43 per cent compared with the quantity (19,800 pounds) entered during the corresponding period of 1930. The entire 1931 shipments originated in France, which also supplied the major portion of the 72,418 pounds and 47,760 pounds of resorcinol imported during 1930 and 1929, respectively.

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THE GENEVA MEETING ON NARCOTIC MANUFACTURE.

The Conference in Geneva to discuss plans for limiting the manufacture of narcotics met on May 27th. The American delegation is headed by John K. Caldwell of the American Consular Service. Senator Louis de Brouckers of Belgium presided at the opening session. The names of the American representatives have been given in a preceding issue of the JOURNAL.

It has been acceded that the United States is the only country that has successfully limited the production of narcotics within its boundaries about an amount sufficient for its own legitimate needs and this may be the basis of the international plan. The Conference has as a basis its discussion, the following major requirements:

(1) That every country shall make known its legitimate needs five months in advance.

(2) That the total quantity of narcotics manufactured shall be limited to this estimated need.

(3) That it shall be decided in advance how much of that total shall be produced in each country.

The principal manufacturers include Holland, France, Germany, Switzerland, Japan and Turkey.

Among the countries represented in the conference are: Albania, Austria, Belgium, Canada, England, China, Cuba, Egypt, France, Germany, Greece, Italy, Mexico, Monaco, Holland, Portugal, Siam, Spain, Switzerland, the United States, Uruguay and Venezuela.

A UNIQUE PATENT OF 60 YEARS AGO.

BY CHARLES WHITEBREAD.

The device for administering pills shown in the accompanying drawings was invented by a citizen of the Province of Ontario, Canada, and patented in 1871. About all the explanation which is necessary concerning this odd apparatus is incorporated in the specification—the inventor's request for Letters Patent—which reads in part as follows:

"* * * The nature of this invention relates to a device having for its object an easy and certain administration of pills to the patient; and it consists in the novel and peculiar construction of the same, which I will now proceed to describe.

"In the drawing, A represents a vessel provided with a handle, B, and spout, C, in the general form of a tea-pot, but much smaller in size. The spout is flattened toward its extremity, to which is soldered, if it be made of metal, a downwardly inclined nozzle, D, the shorter diameter of which should not exceed four-twentieths of an inch, for reasons which will be presently explained. To the end of the nozzle a horizontal mouth-piece, E, is secured, which is intersected at the top, near the nozzle, by an inclined pill-chute, F.

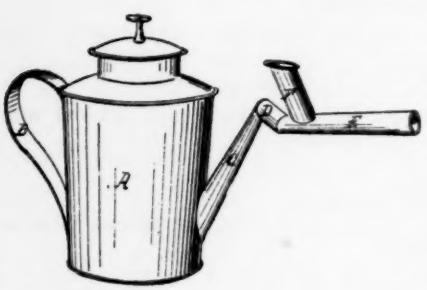

Fig. 1.

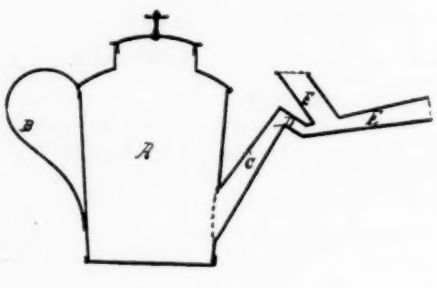

Fig. 2.

"The difficulty of administering pills and powders to all children and very many adults is well known, to overcome which is the object of this invention, which is used in the following manner: The vessel is partially filled with tea, milk or other palatable fluid. The attendant taking it by the handle in one hand, with the pill in the other, presents the mouth-piece to the mouth of the patient, tilts the vessel so that the patient can drink the fluid, dropping the pill down the chute, which is immediately swallowed by the patient with the fluid. If several pills are to be given they should be dropped in the chute at intervals, so that a swallow of the fluid may intervene, thus rendering their administration certain and without the knowledge of the patient. Powders may be given in like manner.

"The object in flattening the mouth of the nozzle to the diameter given is that it shall form a trap, so that the pill cannot accidently pass into the vessel. A perforated strainer in the nozzle might accomplish the same purpose, but it would diminish the flow of the fluid and impair the efficiency of the device. A strainer may be placed at the bottom of the spout, as shown, to prevent tea leaves, etc., from passing out. This device may be made of any kind of metal, glass, china, or earthenware, and may be varied in form to suit the taste. * * *"

The apparatus never came into general use, so played little or no part in overcoming the "difficulty of administering pills." Smaller pills, improved methods of coating, etc., have overcome much of the difficulty mentioned, but no doubt there will always be with us those who, while able to swallow a large bolus of favorite

food rapidly and conveniently, will wince at the taking of a small pill and find difficulty in having it pass down the esophagus. The inventor's desire to administer the pill without the patient's knowledge leads one to believe that he understood he was dealing with a more imaginary than real "difficulty."

The original patent model of the device is on exhibition in the Division of Medicine, U. S. National Museum, where it attracts the attention of those in any way interested in the administering of medicines.

"THE LINE-UP."*

BY JOHN A. J. FUNK.

Independent retail druggists in the larger cities have been contending with chain store competition for a long time. During this period, those in small towns have been looking on with sympathy for their contending brother pharmacists, but with little thought that they would become involved in the conflict. But the spread of chain stores to smaller cities, the improved roads, the automobiles in every family, have made chain stores factors to be considered by every individual pharmacist, wherever located. Yet this condition need alarm no capable pharmacist and business man. Let us assemble the resources and personal equipment of the antagonists, and endeavor to determine who has the most logical chance for success from this line-up.

Location.—The chain stores go to the traffic centers. They know how many people pass a certain location in a day; they know the rush hours; they know the types of people, the class of employments represented. They consider other lines of business at the same location. The independent can surely exercise an equal amount of judgment in selecting his location. He can well afford to spend some time in analyzing the neighborhood before locating, and he should be awake to seize an opportunity, if a better location and building develop near him.

Building and Equipment.—Chain stores have well painted and attractive exteriors; inside, they use standard fixtures, but they specialize in good floors. The independent who fails to have his lease specify that his building shall be kept in repair has lost a point to the chain store.

Stocks.—In proportion to the number of demands and customers they serve, the chains carry smaller stocks than do most independents. They carry carefully standardized stocks, and have the sales-force so well trained that the number of "missed sales" is astonishingly small. The independent druggist who tries to carry, or promises to obtain everything called for, soon has a museum stock and much dead capital.

Display.—The chain store features display; windows are changed weekly, cases are attractively arranged and there are many counter-displays; the independent can match this feature, and where it is done there is reasonable assurance of success.

Salesmanship.—It is generally conceded that the chains have the best sales force. They train their sales-people in groups and individually. They emphasize volume sales, correlated sales and the long-profit items of the store, and no other qualifications of the clerk will do more to hold a job, and deficiency will make the holding of the job uncertain. The independent retailer has an equal oppor-

* Section on Commercial Interests, A. PH. A., Rapid City meeting, 1929.

tunity to pick his employees, and train them in the points of salesmanship; too often, however, the independent permits sentiment or other consideration to influence him to retain inefficient or indifferent help; among the reasons assigned are: "he is always here on time," and "he does not mind working overtime, if he is asked;" "he keeps the store looking nice;" "he is well liked by my trade;" "his father is an old friend and a good customer;" "he works for low wages"—such qualifications without the ability to sell, give the chain store an advantage.

Prices.—Chain stores advertise cut prices, but they could not continue to stay in business if they only sold nationally advertised articles at a little above cost. Their buying power on many such items does not differ greatly from that of the independent; they pay the salaries of special buyers, maintain warehouses, make deliveries to their branch stores, and take the risk of overstocking and depreciation. They carry stocks of certain drugs, sundries and toilet articles bought cheaply, and priced to give them a large profit; and they sell these long-profit items through sales efforts. The independent has a like opportunity to arrange his selling system to produce profit. The meager profit or loss on goods must be made up by a margin of profit which will make up the deficiency.

Prescriptions.—Few chain stores feature prescriptions, some of them have no prescription stock. In some centers, they have one store which fills the prescriptions from other members of the chain. In the prescription service independents usually surpass the chain; the public in general does not seem to care to have its medicines compounded at cut-rate stores. The independent pharmacist who develops his pharmacy on professional lines gains the confidence of the people, and this confidence will extend to other departments of the store, if properly encouraged.

Managers.—The chain store manager is selected for ability, after he has shown in competition with others that he is capable; he is always alert and full of physical "pep;" he is usually paid a bonus in addition to his salary. He knows that he must produce if he would hold his job; one quality that secured this for him and enables him to hold it—is the ability to make others work—the employees in a chain store are kept busy. The manager of an independent store is the owner; he may not be young and physically fit; he has no immediate fear of losing his job; however, if he has the ambition which prompted him to go into business, then he has many advantages over the manager of the chain. He expects to remain in the community and desires to maintain a good reputation. All he creates in the way of business growth is his own, and this has always been recognized in economics as an outstanding asset to the worker. He is stable, he belongs to organizations, and a church; if he has a family, this is a valuable point of contact. In dealing with the public, he is a personality. The people who trade regularly at a store prefer to know that there is someone at the head whom they can see and consult, if occasion ever arises. No one would expect to find the president or head of a chain in the store.

The line-up of factors in modern drug store management herein discussed presents possibilities for the success and points out weaknesses that may account for lack of success by independent retail pharmacists. It will avail nothing to condemn chain methods or bewail misfortunes, but the independent who will study their methods and boldly apply what is best in them to his own business, and who will add the features required by the special problems of his own location and environment can meet and compete with the chain store systems.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor will also undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

ADVERTISING AND SELLING PROBLEMS IN DRUG STORES.

BY PAUL C. OLSEN.

Introduction.

The object of this series of articles is to present in a concise, convenient form facts about advertising and selling methods which can be used profitably in retail pharmacies.

To-day the bulk of the merchandise which is distributed in the drug trade reaches consumers and users through retail pharmacists. Retail pharmacies are the last steps customarily in the movement of goods from the place in which they are made or produced to the place where they are to be used or consumed.

Efficient and profitable operation of drug stores is of the greatest importance, therefore, not only to retail pharmacists but also to all others engaged in the drug trade.

There is a mass of material available upon this subject. Very excellent books upon advertising and selling problems and methods can be consulted. Useful magazine articles on these subjects are appearing constantly. Profit-making ideas in this field are to be obtained from attendance at state and national conventions, other meetings and from wholesalers and manufacturers and their representatives.

The trouble is that when a man works from eight or nine in the morning until eleven or twelve at night several days a week, he has precious little time to read books and magazines and to go to conventions and meetings. This is not a denial in the least of the great importance and high value of constant reading and frequent attendance at meetings. The facts are, however, that only a small proportion of those concerned with the advertising and selling problems of retail pharmacists do take advantage of the opportunities enumerated above to get helpful facts and useful information in this field.

This series of articles is intended to be a simple, systematic description and analysis of the advertising and selling principles and policies which can be used in building up the business of a retail pharmacist. It is written, primarily, in the interest of those who, for one reason or another, find it impossible to read all that is published on these subjects and to attend all the meetings at which these subjects are discussed.

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* Lecturer on Business, Columbia University and Philadelphia College of Pharmacy and Science.

The purpose here is to select from the mass of facts available upon the general principles and problems of advertising and selling those which have a special usefulness in the profitable operation of retail pharmacies. Another purpose is to indicate the special peculiarities and limitations upon the use of general advertising principles and selling policies in the profitable operation of drug stores.

The responsibility which is indicated in the paragraph above is undertaken for those who, with a minimum of time and effort, want to or have to acquaint themselves with profitable advertising and selling methods.

Much of the material which is published on advertising and selling problems is incomplete or inaccurate. A person looking for help in working out advertising and selling ideas in a retail pharmacy is therefore up against two problems.

One is to find, in what time he has available for such a search, ideas which will answer practically and profitably his questions. The second problem he faces is to make a judgment upon the value of what he does find. The object of this series of articles is to survey this whole field and evaluate the ideas which are current.

Thus, with a minimum of time and effort, one can become acquainted with the advertising and selling principles and policies which can be used in building up the business of a retail pharmacy and, at the same time, assure oneself that what is read is correct and in accordance with the best practice. To my knowledge no such effort as this has ever been made before.

Questions and suggestions from readers are particularly welcome. The value of a series of articles such as this depends to the greatest extent upon the practical use which readers can make of the principles and policies set down here.

The following is a list of the general topics to be included in this series of articles:

1. How to determine the potential value of a location. Factors which affect favorably or adversely of a drug store location.
2. Determining how much and what stock to carry. Deciding what to do about cut prices and other price problems.
3. Store lay-out and arrangement. Making a floor plan. Deciding what fixtures and equipment to use.
4. What kinds of displays attract and hold the most attention and make the most sales.
5. Arranging displays to have the greatest selling power.
6. Equipment for displays. Fixtures, decorations, lighting.
7. Bringing in business with advertising: Newspapers, neighborhood papers, programs, electric signs, billboards, street car and bus cards, novelties and samples.
8. Effective appeals in drug store advertising.
9. Getting the biggest returns from letters.
10. Planning advertising campaigns and special selling efforts.
11. Success in personal salesmanship. Elements of the sale. Types and classes of customers.
12. Management of the sales people. Getting their interest and best efforts.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

Program.

AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

(Additions and revisions will be made in next issue of the JOURNAL.)

THIRTY-SECOND ANNUAL MEETING.

Officers: *President*, J. W. Sturmer; *Vice-President*, H. A. Langenhan; *Chairman of Executive Committee*, Charles B. Jordan; *Secretary*, Zada M. Cooper.

Monday, July 27th.

8:30 A.M. Meeting of Executive Committee.

9:30 A.M. Meeting of Teachers' Conferences.

Chemistry, Loyd E. Harris, *Chairman.*

Pharmacy, Charles J. Fuhrmann, *Chairman.*

Materia Medica, A. Richard Bliss, Jr., *Chairman.*

Pharmaceutical Economics, C. Leonard O'Connell, *Chairman.*

CONFERENCE OF TEACHERS OF CHEMISTRY.

Officers: *Chairman*, Loyd E. Harris; *Secretary*, John C. Bauer.

PROGRAM.

1. "The Scope of Pharmaceutical Chemistry," Glenn L. Jenkins. Discussed by Freeman P. Stroup, Chas. B. Jordan, A. H. Clark.

2. "Prerequisites to Pharmaceutical Chemistry," Townes R. Leigh. Discussed by Hugh C. Muldoon, C. C. Glover, Wortley F. Rudd.

3. "Methods of Presenting Pharmaceutical Chemistry," Edward D. Davy. Discussed by Julius A. Koh, Chas. C. Caspari, Louis W. Rising.

CONFERENCE OF TEACHERS OF MATERIA MEDICA.

Officers: *Chairman*, A. Richard Bliss, Jr.; *Secretary*, Franklin J. Bacon. (Program to be announced.)

CONFERENCE OF TEACHERS OF PHARMACY.

Officers: *Chairman*, Charles J. Fuhrmann; *Vice-Chairman*, Ralph E. Terry; *Secretary*, William J. Husa.

PROGRAM.

1. "Pharmaceutical Arithmetic: As a Separate Course," Ralph L. Calvert, Asst. Prof. Pharmaceutical Arithmetic, Philadelphia College of Pharmacy and Science.—To be read by Prof. J. W. Sturmer.

2. "Pharmaceutical Arithmetic: Content of Course," Prof. J. L. Klotz, University of South Carolina, School of Pharmacy.—To be read by Dean E. T. Motley.

3. "Pharmaceutical Arithmetic: Methods Used in Laboratory Teaching," A. O. Mickelson, Dean, North Pacific College of Oregon, School of Pharmacy.

4. "Arithmetical Ability as Shown by Placement Tests," Rudolph H. Raabe, Dean, Ohio Northern University, College of Pharmacy.

5. "Prescription Pricing," Dr. Leonard A. Seltzer, Lecturer, Prescriptions, College of the City of Detroit, College of Pharmacy.

6. "Problems Confronting a Teacher of Dispensing Pharmacy," Louis Wait Rising, Asst. Prof. of Pharmacy, New Jersey College of Pharmacy.

7. "A Course in Drug Assay to Meet Commercial Requirements," Russell L. Taylor, Instructor in Pharmacy, Washington State College.—To be read by Hugh Vincent.

Appointment of Committee on Resolutions.

Address of the President, Julius W. Sturmer.

Report of the Secretary-Treasurer, Zada M. Cooper.

Report of the Executive Committee, Charles B. Jordan.
Report of the Sub-Committee on Bulletins.
Appointment of Nominating Committee.

Reports of Standing Committees:

Committee on Higher Educational Standards, Clair A. Dye.
Committee on Curriculum and Teaching Methods, Townes R. Leigh.

Monday, July 27th, 6:00 P.M.

Annual Dinner.
Address, Dr. James M. Farr, Vice-President of the University of Florida.

Monday, July 27th, 8:00 P.M.

Second Session of Association.

Paper—"Languages in the Four-Year Course," W. J. Husa.
Reports of Standing Committees:

Committee on Activities of Students and Alumni, C. Leonard O'Connell.
Committee on Investigation of Pharmacy Schools by Carnegie Foundation, A. G. DuMez.
Committee on Relation of Boards and Colleges, Edward Spease.
Syllabus Committee, John G. Beard.

Reports of Special Committees:

Committee to Coöperate in an Advisory Capacity in the Revision of the Syllabus, J. A. Koch.
Committee on Student Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION, B. V. Christensen.
Committee on Establishment of a Pharmaceutical Corps in the U. S. Army, A. Richard Bliss, Jr.
Committee on Council on Pharmaceutical Education, A. G. DuMez.
Committee on Revision of Constitution and By-Laws, C. B. Jordan.

JOINT SESSION OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY AND THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

Tuesday, July 28th, 9:00 A.M.

Report of Fairchild Scholarship Committee, E. G. Eberle.
Report of the Committee on the Study of Pharmacy, L. L. Walton.
The Standardization of Pharmacies for Experience Requirements under State Pharmacy Law, George C. Schicks.
What Credit Can Be Given toward the Practical Experience Requirement for Work Done in Colleges of Arts and Science, John A. J. Funk and Edward H. Niles.

Tuesday, July 28th, 2:00 P.M.

Third Session of Association.

Reports of Special Appointees:

Representative to the Drug Trade Bureau of Public Information, E. Fullerton Cook.
Reporter on Biological Abstracts, H. W. Youngken.
Representatives to National Conference on Pharmaceutical Research, H. A. Langenhan.
Representatives to the Druggists' Research Bureau, P. C. Olsen.
Representatives to the National Drug Trade Conference, Ernest Little.
Representative on the Committee on Simplified Practice, L. F. Bradley.
Representative to the National Association of Retail Druggists, C. A. LaWall
Delegates to the American Council on Education, R. A. Lyman.
Historian, Edward Kremers.

Representative on Committee on Centennial Celebration, W. B. Day.
Representative on National Drug Store Survey Committee, C. E. Caspari.

Unfinished Business.
Miscellaneous Business.
Election of Officers.
New Business.
Executive Session.

CONFERENCE OF TEACHERS OF PHARMACEUTICAL ECONOMICS.

Officers: *Chairman*, C. Leonard O'Connell; *Secretary*, Howard E. Newton. (Program to be announced.)

Monday, July 27th, 2:00 P.M.

First Session of Association.

Roll Call.
Memorial to Dean E. V. Howell, John J. Beard.
Memorial to Professor E. A. Southworth, A. Richard Bliss, Jr.

MEETING OF THE U. S. P. BOARD OF TRUSTEES.

The annual meeting of the Board of Trustees of the U. S. Pharmacopœia was held in Washington on May 16th. Those in attendance were: Chairman J. H. Beal, Treasurer Samuel L. Hilton, Secretary Samuel C. Henry, of the N. A. R. D.; Secretary E. F. Kelly, of the A. Ph. A.; Dr. S. Solis Cohen and W. Bruce Philip, San Francisco. Reports were received as to progress made with the revision of the pharmacopœia provided for at the eleventh decennial convention in Washington last year. President W. A. Bastedo and Chairman E. Fullerton Cook, of the U. S. P. Revision Committee, were present.

MEETINGS OF CHEMICAL ASSOCIATIONS.

The Manufacturing Chemists' Association, held its annual meeting at Absecon, N. J., June 4th.

Following this meeting the Association joined the Synthetic Organic Chemical Manufacturers' Association in the customary joint annual outing at the Seaview club. Dr. E. H. Killheffer was toastmaster at the dinner, and Senator H. D. Hatfield, of West Virginia, was the principal speaker.

FORMULAS RECOMMENDED TO BE CARRIED ON SHIPS OF THE UNITED STATES.

The following formulas are a few of many useful formulas recommended to be carrried on ships of the United States.

Gargle Solution Tablets.

Sodium bicarbonate	5 grains
Sodium borate	5 grains
Sodium chloride	5 grains
Sodium benzoate	7/24 grain
Sodium salicylate	7/24 grain
Oil eucalyptus	*q. s.*
Thymol	*q. s.*
Menthol	*q. s.*
Methyl salicylate	*q. s.*

(Alkaline aromatic tablets.)

Unguentum Prophylaxis.

Calomel	33 parts
Camphor	2 parts
Phenol	3 parts
Lanolin anhydrous	39 parts
Benzoinated lard	20 parts
Beeswax	3 parts

(Compound calomel ointment—U. S. Navy Formula 2-dram collapsible tubes.)

Rhinitis Tablets

Powd. camphor	1/2 grain
Fld. ext. belladonna root	1/4 minim
Quinine sulphate	1/2 grain

(Rhinitis, full strength.)

The 1931 A. Ph. A. meeting will be held in Miami, Fla., during the week of July 27th.

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

President, W. M. Hankins, Daytona, Fla. J. W. Gayle, *Treasurer*, Frankfort, Ky. Chairman of Executive Committee, A. C. Taylor, Washington, D. C. *Secretary*, H. C. Christensen, 130 N. Wells St., Chicago, Ill.

ACTIVE MEMBER STATES.

Alabama	Indiana	Montana	Rhode Island
Alaska	Iowa	Nebraska	South Carolina
Arizona	Kansas	Nevada	South Dakota
Arkansas	Kentucky	New Hampshire	Tennessee
Colorado	Louisiana	New Jersey	Texas
Connecticut	Maine	New Mexico	Utah
Delaware	Maryland	North Carolina	Vermont
D. of Columbia	Massachusetts	North Dakota	Virginia
Florida	Michigan	Ohio	Washington
Georgia	Minnesota	Oklahoma	West Virginia
Idaho	Mississippi	Oregon	Wisconsin
Illinois	Missouri	Pennsylvania	Wyoming
		Porto Rico	

TWENTY-EIGHTH ANNUAL CONVENTION NATIONAL ASSOCIATION BOARDS OF PHARMACY.

HOTEL COLUMBUS, MIAMI, FLA., JULY 27–28, 1931.

President W. M. Hankins of the N. A. B. P., himself a Floridian, urges and invites all board members from all parts of the country to attend the Miami conventions the week of July 27th. A very capable and enthusiastic Local Committee, headed by John Clemmer of the Florida Board, have been laboring diligently for months to make this the most interesting, unusual and record-breaking convention of all time. All that remains to be done is for you to come and enjoy it.

A detailed bulletin of information regarding hotels and rates, entertainment, transportation, the post-convention trip to Cuba, etc., will be found on pages 419 of the May issue, 527 of this number.

After perusing the hotel rates and making your selection, be sure to write to Local Secretary G. H. Grommet, 2364 S. W. 11th St., Miami, Fla., immediately for your reservation.

The first N. A. B. P. session will be held on Monday morning at 9:30 A.M. Those who plan to arrive at that time will be able to take advantage of the special excursion rates being offered by the railroads for July 25th (a little earlier from more distant points). The trains on which these tickets are honored will be arriving in Miami Sunday night and Monday morning. The rate is a fare and one-tenth for the round-trip. If the tickets are not available from your home town, the local ticket agent will be able to advise nearest point from which it is offered. *Ask him for full particulars.* The rate does not apply west of Omaha nor in the Southeastern section of the United States.

For those who cannot take advantage of the excursion rate due to location or time of arrival, the AMERICAN PHARMACEUTICAL ASSOCIATION has made

special transportation arrangements. Tickets for the round-trip can be purchased *in advance* and the rate is fare and one-half. In order to purchase these tickets at your local railroad office, you must obtain an identification certificate in advance from Secretary E. F. Kelly, 10 W. Chase St., Baltimore, Md. This is *not* the certificate plan used in former years.

Tickets purchased on either the excursion or identification plan can be routed so as to visit both coasts of Florida without additional cost by rail. Those who have the time can tour the entire state without extra cost.

If you desire more information on vacation possibilities, please communicate with Local Secretary G. H. Grommet, 2364 S. W. 11th St., Miami, Fla., before the meeting.

Credential blanks have gone forward to all board secretaries and a detailed bulletin of information to the membership will go forward soon.

See you at Miami!

H. C. C.

STATE BOARD NEWS.

Alabama.—Secretary Bingham writes that the pharmacy bill introduced in the legislature is "still slumbering on the House calendar." Tax measures have been the only interest of the legislature so far. The pharmacists of the state are fighting hard for legislative action on their bill and have not as yet given up hope.

The next examination meeting of the Board will be held on June 8th at Montgomery, Ala., just prior to the state pharmaceutical association meeting.

Arizona.—At a reorganization meeting of the board of pharmacy held recently, the following officers were elected: *President*, Fred W. Ritter of Phoenix; *Vice-President*, Sam Ensminger of Prescott; *Secretary*, H. A. Twining, of Phoenix; *Supervisor of Examinations*, Arthur Lee Phelps, of Phoenix. The other members of the board are Messrs. E. M. F. Ivey, of Warren, Marshall J. Nicholson, of Willcox, and Paul D. Stormont, of Globe. Messrs. Ensminger and Twining succeed Carroll M. Wood and Fred W. Moore, who retired recently.

Colorado.—As a result of the April examinations, six registered pharmacists and six assistants were granted licenses. The total number taking examination was fifteen.

Results of the May examination held at Denver, at which about 150 candidates were present, have not been announced at time of writing.

Idaho.—The Idaho Pharmacy Board is conducting a regular examination at the University of Idaho, Southern Branch, Pocatello, Idaho, on June 8.

The members of the examining board are as follows: J. P. Halliwell, Pocatello; J. Earl Evans, Idaho Falls; and David S. Dent, Lewiston. F. L. Cruikshank is *Director of the Bureau of Licenses*, and Emmitt Pfost is *Commissioner of Law Enforcement*, both with offices at Boise.

Indiana.—F. W. Meissner of La Porte, Ind., who retired from the Indiana Board a short time ago, was reappointed on May 6 to succeed Scott Kelly of Gaston, who resigned.

Iowa.—An examination was held at Iowa City on June 3 and 4, and another at Des Moines on June 9 and 10, results of which will be published later.

A number of amendments to the pharmacy law were recently enacted, and the Pharmacy Examiners' appropriation for expenses was increased $3400.00 by the legislature.

Governor Dan W. Turner has announced the reappointment of George Judisch to a three-year term on the Iowa Board of Pharmacy.

Kansas.—Governor Woodring recently made two appointments to the state board of Pharmacy.

Percy S. Walker, of Topeka, who has just finished a three-year term, was reappointed for another term.

A. H. King, of Manhattan, former secretary of the Board who retired some time ago, was reappointed to succeed Mac Childs, of Eldorado, the present secretary. The N. A. B. P. is glad to welcome back Mr. King but sorry to see Mr. Childs retire, as he has done some splendid work during his incumbency.

Kentucky.—The Court of Appeals held on May 22 that the Kentucky Board of Pharmacy is entitled to use an injunctive process in enforcing the pharmacy law. For some time past, the Kentucky Board has been obtaining injunctions against a repetition of the offense, such as operating without a registered pharmacist in charge. One such case, decided against the Board in the Bell Circuit Court, was taken to the Court of Appeals and unanimously upheld. Quoting from the opinion, "Manifestly the Legislature did not intend to limit means of enforcement to small and insignificant penalties. The board could make little progress toward enforcing the act if confined to recover small penalties." The Kentucky Board is to be congratulated on establishing this legal precedent.

Three out of a class of eight applicants taking the Registered Pharmacist examination in Louisville in April have been granted licenses; six assistant certificates were issued to the successful candidates out of a class of twenty-two. Also, six pharmacists from other states were registered by reciprocity.

Louisiana.—Paul Eckels, of Crowley, a member of the Louisiana Board, was recently elected president of the Louisiana State Pharmaceutical Association.

John E. Guess of Hammond, secretary of the Louisiana Board, will be the delegate to the N. A. B. P. convention in Miami in July.

Maryland.—The legislative program developed by the Maryland Board of Pharmacy and the Maryland Pharmaceutical Association was successful in the past session of the Maryland legislature. The Pharmacy Law was amended so as to provide for a more adequate and comprehensive definition of a pharmacy, a clarification of the rights and privileges of general merchants when handling drugs and medicines, discontinuation of assistant registration, and the correction of many administrative difficulties with which the board of pharmacy was confronted when dealing with practical experience and other requirements of the law. The law became effective on June 1st.

Missouri.—The *Midwestern Druggist* reports: "In the final scramble to close the longest session in the history of the Missouri legislature, the prerequisite bill, providing for a college course in pharmacy as a prerequisite to examination and registration was lost. That is, it did not get up to a vote of the Senate, and therefore did not become a law."

As some of the Missouri pharmacists who opposed such legistation in the past and prevented introduction of the bill in the past were agreeable this time, it is unfortunate that conditions in the legislature were as they were. However, there should be no difficulty in enacting the provision at the next session of the legislature, two years hence, if the pharmacists again present a united front, as it is hoped they will.

New Jersey.—Practical examinations were conducted by the New Jersey Board on March 26 and 27 and written examinations were given on April 9 and 10 in Trenton. Approximately 120 applicants took the practical examinations and about 130 the written work.

North Carolina.—The Board of Pharmacy met at Chapel Hill for an examination meeting on June 10, results to be announced later.

This was the first meeting at which Mr. W. Lee Moose of Albemarle, the new member appointed to succeed Mr. C. P. Greyer of Morganton, officiated.

Mr. Ira W. Rose, of Rocky Mount, member of the Board of Pharmacy, has been appointed a member of the teaching faculty of the School of Pharmacy of the University of North Carolina. His subject will be operative and dispensing pharmacy.

Ohio.—As the result of an examination held in Columbus in April, thirteen pharmacists out of a class of 41 were granted licenses. Six reciprocal certificates were also approved.

Two candidates tied for the honor of the highest general average in the examination, which was 80%: Miss Masha Braverman, graduate of the College of Pharmacy of the University of Iowa and Mr. Clarence J. Knudson, a graduate of the Toledo College of Pharmacy.

The Hon. Governor George White has appointed Mr. R. C. Knisely of Ravenna, as a member of the board of pharmacy to succeed himself, for a term of five years ending March 31, 1936.

Oklahoma.—A reorganization meeting of the board of pharmacy was held on Wednesday, May 20, membership and officers of the new board being as follows: *President*, Charles L. Rogers, Wewoka; *Vice-President*, Carey F. Miles, Buffalo; *Treasurer*, Thomas B. Casey, Tishomingo; *Secretary*, C. M. Brewer, Oklahoma City; and J. C. Burton, member.

A new campaign has been launched against the operation of drug stores without a license by Secretary C. M. Brewer.

He reports that the 13 drug stores that were functioning without licenses or without a registered pharmacist in charge some three months ago have all complied with the law. Violations in the entire state are less than 2% and these will be looked after as rapidly as time will permit. Charges of violation have already been filed against three stores. Secretary Brewer promises that he will continue this campaign until there is a competent pharmacist in charge of every drug store in the state.

Report of June 2 examination will be announced soon.

Rhode Island.—Michael H. Corrigan, secretary of the Rhode Island Board of Pharmacy, was guest of honor at a testimonial dinner given at the Hotel Narragansett, May 12, by the Rhode Island Pharmaceutical Assn., honoring his appointment as a member of the new Providence Board of Public Safety.

Eighteen of the twenty-eight candidates who took the April examination for assistant pharmacist were successful in obtaining licenses.

South Carolina.—An examination meeting was held on June 15 and 16 at Charleston and the results will be published later.

Texas.—One hundred and ninety-four applicants were examined by the Texas Board of Pharmacy at Beumont, Tex., May 12–14.

Both C. B. Allison, of Dallas, and Paul D. Carroll, of Texarkana, have been reappointed by Governor Ross Sterling for a six-year term.

At the executive meeting of the board, Erwin M. Joseph, of Austin, was elected *President;* Rupert Townsend, of Lamesa, *Vice-President;* C. B. Allison, of Dallas, was reëlected *Treasurer,* and W. H. Cousins, of Dallas, was reëlected *Secretary.*

Utah.—A report on a recent pharmacy examination shows two candidates taking the test for registered pharmacist and one passing; two took the assistant examination and passed.

Joe Kenney, of Milford, and R. L. Fenton, of Parawan, were recently arrested for running pharmacies without licenses, pleaded guilty and were fined $100 each.

Virginia.—J. C. Kearfoot, of Martinsville, was reappointed by Governor Pollard for a term of five years, expiring March 1, 1936.

At a recent meeting of the board held in Richmond, the officers of the board were all re-elected as follows: *President,* W. L. Lyle, Bedford; *Vice-President,* H. C. Littlejohn, Leesburg; *Secretary-Treasurer,* A. L. I. Winne, Richmond.

Wisconsin.—An examination was held at Madison in May at which 163 candidates were examined for registered pharmacist license and 50 passed; 49 were examined for assistant license and 28 passed.

Wyoming.—At a recent meeting of the board of pharmacy, the following officers were elected to serve for a term of two years: *President,* A. E. Roedel, of Cheyenne; *Vice-President,* R. C. Shultz, of Worland; and *Secretary,* Carl C. Earl, of Lander.

Twenty-eight candidates took examination during 1931, fourteen of them passing and obtaining R.Ph. licenses. The next examination will be held at Sheridan, September 14 and 15.

INTELLIGENCE OF DRUG ADDICTS.

Commenting upon the question which is sometimes raised as to whether or not drug addicts are worth reclaiming, Surgeon General Hugh S. Cumming of the United States Public Health Service recently stated that drug addict prisoners who have committed offenses against the United States and who are no longer taking drugs, show, according to preliminary studies of the Public Health Service, a greater proportion of above average intelligence than is observed among non-addict prisoners.

Among the drug addicts studied thirty in every one hundred were above average in intelligence, whereas eighteen in every one hundred prisoners not addicted to the use of drugs were above the average in intelligence. On the other hand, seventeen in every one hundred drug addict prisoners were considered to be normal but of dull intelligence, whereas one in every ten addict prisoners was mentally defective and one in every six among the non-addict prisoners was mentally defective.

COMMITTEE REPORTS

REPORT OF THE VITAMIN ASSAY COMMITTEE OF THE AMERICAN DRUG MANUFACTURERS' ASSOCIATION—TWENTIETH ANNUAL MEETING—MAY 1931.

BY ARTHUR D. HOLMES, CHAIRMAN.

Historical.—In April 1927 the American Drug Manufacturers' Association created a Vitamin Assay Committee to make a careful study of the U. S. P. X method for "Vitamin A Assay for Cod Liver Oil." Subsequently the Vitamin Assay Committee was directed to extend its activities to include a study of methods for the determination of the vitamin A and vitamin D content of cod liver oil and related products. Before proceeding to a discussion of the activities and the results obtained by the Vitamin Assay Committee it may not be out of place to briefly review the events which lead up to the development of the U. S. P. X Method for "Vitamin A Assay for Cod Liver Oil." At the September 1921 meeting of the American Chemical Society, Emmett presented a paper (*Jour. Ind. and Eng. Chem.*, 13, No. 12 (Dec. 1921), 1104) on the urgent need of "Standardized Methods for the Study of Vitamines"—emphasizing the value of coöperative test assays between several laboratories. As a result a Committee of Vitamin Research was appointed by that Society. Since that time this committee has functioned as a clearing house for information obtained from vitamin researches rather than as an active agent for directing laboratory investigation of methods for vitamin assay. During the summer of 1924 certain individuals, who foresaw the important economic rôle that vitamins were to play in medicine, pharmacy, and in animal and human nutrition, felt that steps should be taken to develop methods for the accurate determination of the vitamin content of cod liver oil and other materials intended as supplementary sources of vitamins.

Believing that such methods should be developed with painstaking care by some organization whose professional standing was beyond question, it was proposed to the Division of Biological Chemistry of the American Chemical Society, during its sessions at Ithaca, New York, September 1924, that it should sponsor the preparation of methods for the quantitative determination of vitamins. This proposal was rejected by the Division of Biological Chemistry.

Subsequently it was suggested to the Revision Committee of the United States Pharmacopœia that the preparation of vitamin assay methods could be very properly considered by that Committee during its deliberations in connection with the Tenth Decennial Revision of the United States Pharmacopœia. The Revision Committee, fully realizing the urgent need for vitamin methods, acted upon this suggestion. Invitations were extended to the prominent vitamin investigators to attend a conference which would consider the preparation of vitamin assay methods. The conference was attended by representatives of the medical profession, pharmaceutical manufacturing concerns and Academic Laboratories. During the conference it was agreed that the need for official vitamin assay methods was imperative. Accordingly, the conference developed the method for vitamin A which is described in detail in the U. S. P. X.

To fully appreciate the true significance and the important function performed by this optional U. S. P. X vitamin method one should not attempt to evaluate this method in the light of present-day knowledge concerning vitamins and their reactions. Instead one must attempt to visualize the situation as it existed in 1925. The U. S. P. X Vitamin A Method was a pioneer method and it therefore represented the first concerted attempt anywhere to place vitamin assay on a quantitative basis.

A careful review of the U. S. P. X Vitamin Method will reveal that a large portion of the details now believed essential for vitamin determinations are discussed in that method. The method provided for vitamin B requirements and called attention to the need for considering antirachitic requirements at a time when some of those now prone to criticize the method were denying the existence of the antirachitic vitamin. In the hands of an experienced person the method is entirely workable as is attested by the fact that comparable results have been obtained by laboratories employing this method. In recognition of the important service rendered by this method, it may be stated that the quality of the cod liver oil sold in this country has been maintained at a much higher level than would have otherwise been the case if no standard procedure had been developed. To this end it has served its purpose and served it well.

Discussion.—However, it is frankly recognized that the use of the U. S. P. X Method presents some difficulties, particularly in the hands of inexperienced workers and furthermore the U. S. P. X does not require the determination of vitamin D. It is our opinion that the forthcoming U. S. P. XI should require assay methods for both vitamin A and vitamin D in cod liver oil and related products. Accordingly, your Vitamin Assay Committee has for more than four years been giving careful attention to the development of vitamin A and vitamin D assay methods which combine the advantages of accuracy, convenience, the least possible demand of time and expense, and workability in the hands of those possessing only a moderate amount of experience in vitamin research.

At the Nineteenth Annual Convention, this Committee presented a report of the results of its study during the year preceding April 1930. During the past year the Committee has given attention to improving the methods for vitamin A and vitamin D assays which it tentatively suggested at the annual meeting.

As the studies of the Vitamin Assay Committee have become more detailed and more extended it has become increasingly evident that it was imperative to develop specifications for the various ingredients of the experimental rations which would insure uniformity of ingredients purchased by the several coöperating laboratories. For instance, it was found that dextrinized corn starch, when purchased by name only, might contain from 5% to 95% of dextrin. A similar condition existed regarding other ingredients. Hence it was evident that attention should be given to the preparation of definite specifications for all ingredients to be included in the experimental rations. As a result of extensive correspondence such specifications have been prepared and are appended to this report. It will be noted that the nature or quality of a number of the ingredients are specified by brand name, or through the courtesy of various individuals associated with the concern providing the material in question. While this arrangement has provided for the present needs of the Committee members, it is obvious that all the specifications should be so carefully developed that uniform materials are assured regardless of the source of supply.

The April 1930 Report contained a suggestion by your committee that "Cod liver oil may be assayed for its vitamin A content by the following process or method. When so assayed the oil shall contain at least 250 vitamin A units per Gm." In the light of recent developments and additional information the committee now recommends that "Cod liver oil shall be assayed for its vitamin A content by the following process or method. When so assayed the oil shall contain at least 400 vitamin A units per Gm."

During the past year a comparison has been made of the effectiveness of the methods as outlined in the 1930 report when the Vitamin Restricted Diet was included and when it was omitted. The object of this test was to determine whether the method could be simplified by omitting this Restricted Diet and continuing the young animals on the Breeders' Diet until they were put on the Vitamin A Free Diet. It was found when the Vitamin Restricted Diet was included that (*a*) xerophthalmia developed about five days earlier and (*b*) xerophthalmia and declining weight occurred simultaneously more frequently than when the Vitamin Restricted Diet was omitted. Hence the Committee recommends that the Vitamin Restricted Diet be included.

Evidence has been collected that cod liver oil, highly diluted with peanut or corn oil and frequently exposed to the air, loses vitamin A value. Accordingly, instead of making a single dilution of cod liver oil to be used for the entire 35-day test period, the Committee recommends that dilutions of cod liver oil in peanut or corn oil be prepared at weekly intervals.

From time to time reports have appeared in the literature of studies of the value of the so-called colorimetric methods for determining the vitamin A content of cod liver oil. By some it is stated that the antimony trichloride colorimetric method can be relied on for assaying cod liver oil for its vitamin A content. Others are equally certain that the method is untrustworthy. This question is of major importance to those interested in the vitamin assay of cod liver oil for if a reliable rapid method were available the time and expense of the present biological method would be materially reduced. Your Committee recommends that this subject be given further study.

Your Committee's 1930[1] report also recommended that the vitamin D method should provide that "when so assayed the oil shall contain at least 60 vitamin D units per Gm." Results obtained during the past year indicate that this requirement is too low and your Committee there-

[1] Jour. A. Ph. A., 19 (1930), 616.

fore suggests that this provision be modified to read: "When so assayed the oil shall contain at least 100 vitamin D units per Gm."

It has been observed that the results attained in testing for vitamin D are influenced to some extent by the degree of rickets produced in the experimental animals previous to the administration of the vitamin containing substance. Hence it appeared desirable to provide means for describing the degree of rickets which could best serve as a criterion for commencing administration of the vitamin containing substance to be tested. Accordingly, a series of measurements were made of the width of the cartilage in the tibiæ of animals which were considered as having developed a satisfactory degree of rickets. While the width was found to be quite uniform it depended upon the section at which the measurement was taken. Since no section can be satisfactorily designated at which this measurement should be taken it appeared impractical to carry out this procedure and the Committee does not recommend it.

Further experience in the use of the vitamin D test as outlined in the 1930 report which recommended that the test animals be fed cod liver oil for eight consecutive days and killed at the end of the tenth day shows that this procedure yields reliable results. The Committee, therefore, strongly recommends the general adoption of this procedure.

Recently the Revision Committee of the United States Pharmacopœia has been formulating plans for a sub-committee which shall develop vitamin A and vitamin D methods to be included in the forthcoming U. S. P. XI. After careful consideration your Committee has unanimously agreed that the methods which will be developed by the U. S. P. Vitamin Sub-Committee should be put to actual test before becoming official. In view of this decision the chairman of your Vitamin Assay Committee inquired of the Revision Committee of the U. S. P. whether it desired to have the forthcoming vitamin methods tested. The chairman replied that the Revision Committee was very much interested in having the forthcoming U. S. P. methods given an actual test under typical laboratory conditions. Your Vitamin Committee now awaits the direction of the American Drug Manufacturers' Association as to your pleasure in the matter.

The various modifications that have been made in the vitamin A and vitamin D methods since the 1930 report appeared are included in the detailed outline that follows. Your Committee recommends the adoption of these improved methods fully appreciating that as additional data accumulate modifications may become necessary.

VITAMIN A AND D ASSAY FOR COD LIVER OIL AND RELATED PRODUCTS—MAY 1931.

I. Vitamin A.—Cod liver oil shall be assayed for its vitamin A content by the following process or method. When so assayed the oil shall contain at least 400 vitamin A units per Gm.

This assay is based upon the estimation of the minimum amount of cod liver oil necessary to meet specific growth-promoting as well as relative antiophthalmic requirements in a standard test animal kept under definite control as regards source, age and food supply. The test animal shall be albino rats from known source and bred preferably under the direction of the experimenter.

BREEDERS' DIET.

Wheat meal (entire kernel)	33.0%
Yellow corn meal (entire kernel)	34.0%
Whole milk powder	21.0%
Old process linseed oil meal	7.0%
Alfalfa leaf flour (green color)	2.0%
Liver (vacuum dried)	2.0%
Calcium carbonate ($CaCO_3$)	0.5%
Sodium chloride (NaCl)	0.5%

The vitamin A potency of cod liver oil shall be expressed in units per Gm. of oil, the unit to be the minimum daily amount (in mg.) of cod liver oil required to cause, in sixty per cent of the animals in any one group, a gain in weight of at least 15 Gm. within a period of thirty-five days under the conditions of growth and diet specified in this assay. The maximum weight must be attained at the end of the test and the eye condition must be corrected by an amount of cod liver oil not to exceed three times the minimum growth factor.

The vitamin A content per Gm. of cod liver oil is computed by dividing 1000 mg. (1 Gm.) by the determined minimum daily amount of oil, in mg., required to induce the requisited growth recovery.

Method.—It is desirable that each laboratory should establish its own breeding colony or else secure rats under known conditions as to age and dietary history.[1]

To obtain suitable test rats for vitamin A and D assay, females from the colony should be used to rear the actual test animals. These females should be taken off the Colony Diet as soon as weaned and fed the Breeders' Diet below. Later they are placed on a Restricted Diet as stated elsewhere.

This diet must be supplemented daily by the addition of fresh green leafy material preferably lettuce or spinach, about 5 Gm. being sufficient per rat per day.

When about 100 days old, the females are mated with males which are continuously maintained on the Breeders' Diet. When the young are five to seven days old, the litters should be adjusted to seven animals for each female. On the tenth to twelfth day the mothers are given the Vitamin Restricted Diet.

VITAMIN RESTRICTED DIET.

Wheat meal (entire kernel)	33.0%
Yellow corn meal (entire kernel)	34.0%
Skimmed milk powder	21.0%
Old process linseed oil meal	7.0%
Yeast (dried) (1)	4.0%
Calcium carbonate ($CaCO_3$)	0.5%
Sodium chloride (NaCl)	0.5%

Later when these rats are weaned (21–23 days old) the mothers are then returned to the Breeders' Diet (not the Colony Diet). The young are continued on the Vitamin Restricted Diet until they are twenty-five to twenty-nine days old at which time they should weigh thirty-eight to forty-five Gm. They are then fed the Vitamin A Free Diet so as to deplete them for the vitamin A Test.

VITAMIN A FREE DIET.

Casein (Vitamin A Free) (2)	18%
Salt mixture (Osborne-Mendel or McCollum No. 185)	4%
Agar (finely ground)	2%

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[1] The following well-balanced diet, rich in vitamins, has been found satisfactory as a Colony Diet:

COLONY DIET.

Wheat meal (entire kernel)	33.0%
Yellow corn meal (entire kernel)	33.0%
Whole milk powder	21.0%
Old process linseed oil meal	7.0%
Alfalfa leaf flour (green color)	2.0%
Liver (vacuum dried)	2.0%
Calcium carbonate ($CaCO_3$)	0.5%
Sodium chloride (NaCl)	0.5%
Cod liver oil (of high vitamin assay)	1.0%

The ingredients of all diets should be ground fine enough to insure a uniform mixture. The diet, with the exception of the whole milk powder and the cod liver oil, may be mixed in large quantities and the milk powder and cod liver oil should be added to such portions as will be consumed in about one week.

This Colony Diet must be supplemented daily by the addition of fresh green leafy material. An approximate allowance of about 5 Gm. daily per rat of this material should be sufficient. Boiled bone or other hard materials should be supplied occasionally for gnawing.

Yeast (dried) (1)	8%
Corn starch	63%
Hydrogenated vegetable oil (Vitamin A Free)	5%
Vitamin D (3)	

(1) The vitamin "B" value of the yeast should be such that not more than 150 mg. of the yeast is required for a daily-rat-weight recovery dose when animals are on the Sherman Basal Vitamin B Free Ration.

(2) Casein which will pass through a No. 60 sieve is treated with denatured alcohol "3A" (which is a mixture of 100 parts of ethyl alcohol and 5 parts of methyl alcohol).

Reflux 20 lbs. casein 1 hr. with 7 gals. 3A alcohol
Filter
Reflux 1 hr. with 5 gals. 3A alcohol
Filter
Allow casein to stand over night in 5 gals. 3A alcohol
Reflux 1 hr. with 5 gals. 3A alcohol
Filter
Reflux 1 hr. with 5 gals. 3A alcohol
Filter
Wash with 3 gals. 3A alcohol

Drain and dry the washed casein in a current of air for 16 hrs. at 120° F. in layers not over $^1/_4$ in. deep.

(3) In order to insure sufficient antirachitic activity one-fourth of the yeast should be irradiated before it is incorporated in the diet. To accomplish this the powdered yeast in a layer not exceeding one-sixteenth of an inch in depth is irradiated for fifteen minutes at a distance of 12 or 18 inches with a quartz mercury vapor lamp. The yeast should be stirred during exposure. If desired, the antirachitic factor may be supplied by other materials. Whatever material is used, it must be Vitamin A Free and its antirachitic potency should be such as will provide antirachitic activity in the diet equivalent to 3% of a cod liver oil having 100 vitamin D units per Gm.

VITAMIN A TEST.

The animals should be fed the Vitamin A Free Diet until there is either a decline in weight or a stationary weight for at least seven days. Preferably xerophthalmia should be manifest at this time but declining weight or stationary weight for seven days and definite eye conditions do not necessarily occur simultaneously. In any case, the weight criteria should be used for the administration of cod liver oil to the test animal. As a check, the control test rats must show both symptoms not later than 10 days after the administration of the cod liver oil to the test animals has begun. In order to insure more comparable conditions the beginning of the administration of the cod liver oil should preferably not occur before the 30th day or after the 45th day of the Vitamin A Free preparatory period.

The experimental animals should be divided into groups of six rats each, one group to serve as a control and the others to be treated with varying amounts of the cod liver oil under test, each animal within the respective groups being given the same dosage.

Cod liver oil being so potent should be diluted with a vitamin A and D free oil such as peanut or corn oil. These dilutions should be prepared as often as once per week. . The total daily volume of the diluted oil for each rat shall be 0.1 cc. This diluted cod liver oil should be fed separate from the diet. The control animals should receive 0.1 cc. daily of the oil used as a diluent. The time for its administration should be judged by the same criteria as that for the cod liver oil.

Any animal that dies from causes other than vitamin A deficiency in less than two weeks after the beginning of treatment should not be included in judging the results of the test. A record should be made three times a week of the body weight and the condition of the eyes during the test period. The condition of the eyes may be recorded as normal, watery, sensitive to light oedema, bloody exudate, pustules and opacity of cornea.

II. Vitamin D (Antirachitic).—Cod liver oil shall be assayed for its vitamin D content

by the following method. When so assayed the oil shall contain at least 100 vitamin D units per Gm.

This assay is based upon the estimation of the minimum amount of cod liver oil necessary to initiate a specific degree of recalcification in the leg bones of rachitic rats reared and fed under definite control as specified.

The vitamin D potency of cod liver oil shall be expressed in units per Gm. of oil, the unit to be the minimum average daily amount (in mg.) of cod liver oil required to produce, in sixty per cent of the animals in any one group, a degree of recalcification represented by a narrow continuous "line" across the metaphysis of the leg bones of the rats which have been kept and fed under the conditions as specified in the assay.

The vitamin D content per Gm. of cod liver oil is computed by dividing 1000 mg. (1 Gm.) by the determined minimum average daily amount of oil, in mg., required to induce the requisite degree of recovery. The average daily dose is understood to be the total amount of cod liver oil given divided by the length of the test period, ten days.

Method.—Experimental animals for vitamin D test, obtained from mothers which have been reared and bred on the Breeders' Diet, are fed the Vitamin Restricted Diet until they are twenty-eight to thirty-two days old and weigh fifty to sixty Gm. They are then fed the Steenbock Ricket-Producing Diet, No. 2965, or the McCollum Ricket-Producing Diet, No. 3143.

Steenbock Ricket-Producing Diet, No. 2965.		McCollum Ricket-Producing Diet, No. 3143.	
Whole yellow corn (freshly ground)	76%	Corn (yellow)	33%
Wheat gluten	20%	Wheat (soft winter wheat)	33%
Calcium carbonate ($CaCO_3$)	3%	Wheat gluten	15%
Sodium chloride (NaCl)	1%	Gelatin	15%
		Calcium carbonate ($CaCO_3$)	3%
		Sodium chloride (NaCl)	1%

During the period of preparation for the test and while on test the animals should receive distilled water.

After the experimental animals have been on the rachitic diet for a suitable period (18 to 20 days) examine four rats, by the "line test" as described later, to ascertain whether a satisfactory stage of rickets has been attained. If so, the remainder are considered as satisfactory for the test and should be divided into groups of seven animals each. It is desirable to have at least four groups, one as control and three for treatment with the cod liver oil in varying doses so that one can judge the potency of the oil above and below the unit value sought.

From the beginning of administration of the cod liver oil the rats should be kept in individual cages and a record should be made of the daily food consumption.

The cod liver oil should be diluted with a vitamin A and D free oil, such as peanut or corn oil so that the total daily volume of oil consumed by each rat shall be 0.1 cc. These dilutions should be prepared as often as once per week. The oil should be fed separate from the diet. A control group of representative animals should receive 0.1 cc. daily of the diluent.

The diluted cod liver oil (or the diluent) should be given for eight consecutive days. The rats are continued on the rachitic diet for two remaining days of the test period to allow for the latent effect of the cod liver oil.

Any animal which has lost weight continuously during the test period; has eaten less than two Gm. of food on two consecutive days; or has averaged to eat less than four Gm. of food per day should be excluded from the final interpretation.

At the conclusion of the tenth day of the test, the animals should be killed and the femur and tibia bones (or ulna and radius) removed from the right leg and preserved in formaldehyde (10%) for examination. When ready for staining the bones should be thoroughly rinsed in water, split, placed in acetone for three minutes, dried on a blotter, placed in silver nitrate (2%) three minutes, intensified under bright light until the "line" is clearly evident, placed in sodium thiosulfate solution (5%) for three minutes and examined under a microscope. Reserve the bones from one other leg in formaldehyde for possible confirmation test.

SOURCES AND SPECIFICATIONS FOR MATERIALS USED IN THE PREPARATION OF EXPERIMENTAL DIETS RECOMMENDED BY THE VITAMIN ASSAY COMMITTEE FOR THE VITAMIN A AND D ASSAY OF COD LIVER OIL.

Agar—Parke, Davis & Co., Detroit, Michigan.—Specifications: To be requisitioned as Powdered Agar No. 826256 for A. D. M. A. (Emmett). A special lot has been set aside for this year's investigations.

Alfalfa Leaf Meal—The Garten Feed Co., 515 South Senate Avenue, Indianapolis, Indiana.—Specifications: Alfalfa Leaf Meal Triple Ground No. 1 Meal. Protein 17 to 20%–Fibre 18 to 20%.

Casein—The Casein Manufacturing Company of America, Inc., 205 East 42nd Street, New York, N. Y.—Specifications: D-3 Brand; Acidity 2.5%; Moisture 10%, Ash 4%, Fat 2%.

Corn Starch—Stein, Hall & Co., Inc., 285 Madison Ave., New York.—Specifications: Special material for vitamin studies.

Gelatin—American Agricultural Chem. Co., Michigan Carbon Works, Detroit, Michigan.—Specifications: Finely ground No. 431.

Gluten, Wheat—The Pure Gluten Food Co., 90 W. Broadway, New York.—Specifications: Dry Basis.

Ether Extract	1.99
Ash	1.54
Protein	81.08 (equal to 14.22% Nitrogen)
Starch not over	0.11
Crude Fibre	0.40
Nitrogen Free Extract	14.99

Hydrogenated Vegetable Oil—Purchase locally.—Specifications: Crisco.

Linseed Oil Meal—The Garten Feed Co., 515 South Senate Avenue, Indianapolis, Indiana.—Specifications: Old Process Linseed Oil Meal—34% Protein.

Liver—The Wilson Laboratories, 4221 South Western Avenue Blvd., Chicago, Illinois.—Specifications: (1) The kind of liver to be used—hog liver; (2) Liver to be dried in a vacuum of not less than $27^1/_2$" and a circulating temperature of 170° F.; (3) The product is not to be defatted or treated in any way; (4) The product to be ground to about 40 mesh.

Milk Powder, Skim—Milk Powder, Whole—The Borden Company, North Franklin Street, Syracuse, N. Y.—Specifications: A sufficient quantity of these products will be reserved by the Borden Company to meet the needs of all members of the Committee.

Peanut Oil—Welch, Holme & Clark Co., Inc., 563 Greenwich St., New York.—Specifications: Acid less than 0.05%, fire about 665° F., flash about 570, Cold Test about 35°, Saponification number about 190 and iodine number about 89.

Salts—Purchase of any reputable manufacturer.—Specifications: C. P. or U. S. P.

Wheat Flour—Frank T. Caughey, Detroit, Michigan.—Specifications: Ground soft winter wheat—entire kernel—preferably white (ground superfine to pass a 20-mesh sieve or finer). Attention: Mr. Bauman.

Yeast—Northwestern Yeast Company, 1750 North Ashland Avenue, Chicago, Illinois.—Specifications: Pure Dehydrated Yeast—99% must pass through a No. 60 sieve.

Yellow Corn—Frank T. Caughey, Detroit, Michigan.—Specifications: Ground yellow corn—entire kernel (ground superfine to pass at least a 20-mesh sieve). Attention: Mr. Bauman.

Officers American Historical Society.—*President*, Prof. Carl Becker, Cornell University; *First Vice-President*, Prof. Herbert E. Bolton, University of California; *Second Vice-President*, Charles A. Beard, New Milford, Conn.; *Secretary*, Prof. Dexter Perkins, University of Rochester; *Treasurer*, Constantine E. McGuire, Washington.

The next annual meeting will be held in Minneapolis.

INDIA CINCHONA CULTIVATION.

The report of the Bengal Cinchona Department for 1929–1930 indicated an area under cultivation of 2877 acres. The bark harvested in Bengal amounted to 1,130,400 pounds. About 29,000 pounds of crude quinine sulphate, 15,700 pounds of cinchona febrifuge powder and 4350 pounds of cinchona febrifuge tablets were produced. (Vice-Consul Dorsey G. Fisher, Calcutta.)

PHARMACOPŒIAL VITAMIN CONFERENCE.

(ABSTRACTED FROM A REPORT BY CHAIRMAN E. FULLERTON COOK.)

A conference of experts in vitamin investigation was held under the auspices of the U. S. Pharmacopœial Board of Trustees and Revision Committee on Thursday, May 7th, at the Hotel Pennsylvania, New York City. There were present, at the invitation of the Committee of Revision, Dr. Lafayette B. Mendel of Yale, the discoverer of vitamin A; Dr. E. V. McCollum of Johns Hopkins University, the discoverer of vitamin D; Dr. H. C. Sherman of Columbia University, chairman of the American Chemical Society Vitamin Committee and Dr. Alfred B. Hess of New York City, both pioneer investigators in this field. Dr. E. M. Nelson, representing the Food and Drug Administration of the Department of Agriculture; Dr. W. H. Sebrell, of the Public Health Service, National Institute of Health, Washington; Dr. Arthur D. Holmes, Chairman of the A. D. M. A. Vitamin Committee, were also in the conference. The following additional workers were also present:

Dr. C. B. Benjamin, Dr. Charles E. Bills, Dr. Archie Black, Dr. John Dorsey Craig, Dr. Adolph G. De Sanctis, Dr. R. Adams Dutcher, Dr. Walter T. Eddy, Dr. A. D. Emmett, Dr. M. S. Fine, Dr. Arthur D. Holmes, Dr. William J. Horn, Dr. Charles W. Hooper, Dr. James H. Jones, Dr. Robert L. Jones, Dr. Henry T. Mason, Dr. Carl Nielsen, Dr. L. S. Palmer, Dr. H. W. Rhodehamel and Dr. H. C. Sherman.

Chairman E. Fullerton Cook, of the U. S. P. Committee of Revision, presided. Those at the Conference were all members of a Vitamin Committee organized some months ago as an auxiliary Committee of the U. S. P. Revision which includes the following additional workers in vitamin standardization:

Dr. John F. Anderson; Dr. J. H. Burn, Director of the Biological Laboratories, Pharmaceutical Society of Great Britain, London, England; Dr. Harriette Chick, Lister Institute, Chelsea Gardens, S. W. 1; Dr. Katharine H. Coward, Pharmacological Laboratories, Pharmaceutical Society of Great Britain, London, England; Prof. J. C. Drummond, University College, London, England; Mr. C. H. Hamsphire, Secretary, British Pharmacopœia Commission, London; Dr. E. Mellenby, Chairman of Accessory Food Factors Committee (Vitamin) of British Medical Research Council and Chairman of Vitamin Standards Sub-Committee of Biological Standardization of Health Committee of League of Nations, Sheffield, England; Dr. A. Graeme Mitchell, University of Cincinnati; Dr. Earl R. Norris, University of Washington, Seattle; Prof. E. Poulsson, Norway; Dr. Floyd K. Riggs, Rutgers University, New Jersey College of Pharmacy; Dr. Harry Steenbock, University of Wisconsin, Madison, Wisconsin.

Sixteen subjects were discussed. The agreements reached at this meeting will be formulated by an interim committee to consist of Doctors Sherman, Mendel, Nelson, Bills, McCollum, Holmes and Steenbock. This Committee will meet, if possible, before some of the members sail for London to attend the conference called by the Health Organization of the League of Nations and will agree upon a presentation of the conclusions of the American Conference for presentation in London. The London meeting will convene on June 17th and it is known at the present time that Dr. McCollum and Dr. Steenbock will be American delegates, although possibly other members of the Committee may be able to attend.

The international agreements reached at the London Conference will in turn be brought to the attention of the American Committee at another Conference planned for next Fall. Members of the American Conference have already agreed that the decisions of this second American Conference will be given a thorough and practical trial in a number of American laboratories for a period of one year before the conference makes its final recommendations for Pharmacopœial adoption.

When these recommendations are finally presented to the Committee of Revision it is recommended that the Revision Committee publish these as the Pharmacopœial standards, to go into effect within a reasonable time without waiting for the appearance of the U. S. P. XI. This policy of issuing modifications of U. S. P. Standards in the period between revisions is one which is well established and for which there has been ample authority and precedence in all recent revisions. In the U. S. P. X, in the General Principles adopted by the 1920 Convention, is found the following authorization: "It is recommended that the Committee of Revision be authorized to prepare supplements to the Pharmacopœia, or lists of admissions or changes at any time they

may deem such action desirable." The Pharmacopœial Convention of 1930 adopted an exactly identical clause.

Two outstanding difficulties attend the modification of an official standard in the interim period; first of these is *the necessity of the utmost care in the preparation of a new standard* and this is being amply protected in the case of the vitamins. A second difficulty is *the lack of necessary publicity;* the old standards being those always easily available in the printed book, but it is believed that again ample publicity can be secured for a subject so important as the vitamins.

PHARMACEUTICAL SERVICE IN THE U. S. ARMY.

A conference, participated in by officers of the Medical Department of the Army, including Surgeon General Merritte W. Ireland and Colonel Robert U. Patterson,[1] who will succeed General Ireland as Surgeon General when the latter goes on the retired list on May 31st, and representatives of the AMERICAN PHARMACEUTICAL ASSOCIATION, was held in Washington on May 22, 1931.

During recent months, other conferences between the groups have been held with the object of working out legislation, satisfactory to the Army authorities and to the pharmaceutical representatives, for the improvement of the pharmaceutical service in the Army, including the commissioning of pharmacists—as a part of a general plan being developed to improve the Medical Department. It has been agreed that improvement and extension of the pharmaceutical service in the Army is essential to such a plan. The question still open is how this can best be done to accord with the military organization and the views of pharmacy.

The recent conference was for a further consideration of this question and also to acquaint Colonel Patterson with the progress already made toward agreement between the two groups.

A complete report of these conferences will be made by the Committee on Pharmacy Corps in the U. S. Army at the Miami meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION which will be attended by Colonel A. D. Tuttle as the representative of the Medical Department and of the Surgeon General.

Colonel Tuttle will discuss the legislation now pending before Congress for improving and extending the pharmaceutical service in the Army and will explain the plans which the Medical Department considers as essential to effective military operation from the standpoint of experience with the public health professions in the Army. Colonel Tuttle has taken great interest in these plans and is well qualified by professional training and army experience to discuss them from the military and professional points of view.

[1] Now in office.

NETHERLANDS INCREASES IMPORTS OF QUININE AND QUININE SALTS FROM JAVA AND MADURA.

Exports of quinine and quinine salts from Java and Madura to the Netherlands have doubled during the last three years. According to statistics of the two islands, 30 metric tons went to the Netherlands, as compared with 20 tons in 1929, and 15 tons in 1928. China purchased an average of 11 tons annually, while exports to Japan decreased to 3 tons in 1930, as against 5 tons in 1929, and 11 tons in 1928. British India bought about 3 tons yearly during the above period. (Trade Commissioner Richard P. Hendren, Batavia.)

CINCHONA EXPERIMENTATION IN PHILIPPINES.

The Philippine Bureau of Forestry has been experimenting with the production of cinchona on a small scale in the Province of Bukidnon, Mindanao, for a number of years. On March 27th, on recommendation of the Malaria Control Board, Acting Governor-General Butte approved an appropriation of $7500 annually to be used by the Director of the Bureau of Forestry in the furtherance of this work. Information from Forestry officials is to the effect that 12,000 trees are now growing successfully and that 50,000 cuttings are ready for planting. (Trade Commissioner E. D. Hester, Manila.)

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1930–1931.

Office of the Secretary, 10 West Chase Street, Baltimore, Md.

LETTER NO. 11.

May 28, 1931.

To the Members of the Council:

106. General Program of 1931 Meeting. Motion No. 35 (see Council Letter No. 10, page 505) has been carried and the program is approved.

107. Meeting of the Committee on National Formulary. Motion No. 36 (see Council Letter No. 10, page 507) has been carried and Chairman Gathercoal has been so advised.

108. Election of Members. Motion No. 37 (see Council Letter No. 10, page 507) has been carried and applicants numbered 327 to 428, inclusive, are declared elected.

109. N. F. Exhibit at the Meeting of the American Medical Association. Motion No. 38 (see Council Letter No. 10, page 509) has been carried and Secretary Nichols of the Committee on N. F. has been so advised.

110. Investment of Funds. (*See Motion No. 34,* Council Letter No. 9, page 404.) Treasurer Holton reports the purchase of one $1000 City of Paterson, N. J., Bond, 4%, due serially from 1950 to 1970, on a 4.10% basis and accrued interest, for the Endowment Fund. The investments held for this fund total $13,600.

111. Use of the Text of the N. F. V. The following communication has been received from Chairman DuMez of the Committee on Publications:

> "In response to the request of W. H. Martindale of London, England, requesting permission to use portions of the text of the N. F. V in the coming revision of his book entitled Extra Pharmacopœia, which is the 19th Edition, it is recommended that this permission be granted.
>
> "I am of the opinion that it is unnecessary to take this matter up with the members of the Publication Committee as permission to use the N. F. text in the manner requested was granted in the case of the two previous editions of this work. So far as I am able to determine from the sample pages enclosed, there is no change contemplated in the manner of using the text in the new revision, hence it is not likely that the Publication Committee would change its attitude."

(*Motion No. 39*) *It is moved by DuMez that W. H. Martindale of London, England, be given permission to use the text of the N. F. V for partial reproduction in the 19th Edition of the Extra Pharmacopœia and at the usual charge of $5.00.*

112. State College of South Dakota Student Branch, A. Ph. A. President Ferdinand Fritsche has submitted the following:

> "We, the undersigned members of the Student Body of the Division of Pharmacy, South Dakota State College, wish to organize ourselves into a student branch to be known as the South Dakota State College Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION and do hereby make formal application to the Council for approval of such a branch. The Constitution and By-Laws of the Branch are submitted for approval:
>
> Carl W. Thurston
> Harvey Engstran
> Edward J. Fischer
> Stanford Sylvan Maresh
> Russell M. Park
> Leah May Payne
> Clarence Bernard Wieczorek
> Alvin F. Nelson
> Eldon B. Erickson
> Merle Francis Yelinek
> Herbert J. A. Richter
> Francis O'Connell
> Irvin James Maloney
> George Andrew Lehr
> Welles Carl EerNisse
> Edward A. Pelant II

Ben Agrant
Lon T. Pfeiffer
Ferdinand H. Fritsche
Albert G. Horst
Oscar George Lippert
Virgin Dotseth
Harold G. Reynolds
James N. Etteldorf
Clarence A. Dangers
William Howard Grady
Robert Gruetzmacker
Arthur R. Hurst
Harriet Aldrich
Wayne Clark Shanholtz
Leon E. Schule
Alvin E. Olson

The Constitution and By-Laws, as submitted, are as follows:

PREAMBLE AND BY-LAWS OF SOUTH DAKOTA STATE COLLEGE STUDENT BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

In order to stimulate a better acquaintance of Student and Faculty for the exchange of ideas and for the betterment of Pharmacy at South Dakota State College, we, the undersigned, do hereby resolve to constitute ourselves into a student branch of the AMERICAN PHARMACEUTICAL ASSOCIATION for the purpose of advancing the objects for which the body was founded. The Branch hereby adopts for its guidance the Constitution and By-Laws of the AMERICAN PHARMACEUTICAL ASSOCIATION, and its members hereby subscribe to them.

ARTICLE I—MEMBERS.

This branch shall consist of active and associate members.

ARTICLE II—ACTIVE MEMBERS.

All members of the South Dakota Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION be members regularly enrolled in Pharmacy in South Dakota State College, on signifying their intention of adhering strictly to the provisions enumerated in the preamble and in the constitution of the AMERICAN PHARMACEUTICAL ASSOCIATION, be elected to active membership of this branch.

ARTICLE III—ASSOCIATE MEMBERS.

Any person who is not an active member, but who manifests his interests either by contribution or active participation of work or research, scientific papers, or adds to its financial resources, shall be termed an associate member, but without the right to vote.

ARTICLE IV—OFFICERS.

The officers of the Branch shall be a president, vice-president, secretary and a treasurer.

ARTICLE V—COMMITTEES.

At the first January meeting of each fiscal year or as soon thereafter as possible, the president shall appoint three standing committees as follows: a Committee on Program, to consist of three members; a Committee on Student Activities, to consist of three members; and a Committee on Membership, to consist of three members.

ARTICLE VI—EXECUTIVE COMMITTEE.

The officers of the Branch and chairmen of the Standing Committees shall constitute the Executive Committee, to transact all the necessary business usually transacted by such a committee.

ARTICLE VII—MEETINGS.

The meetings of the Branch shall be held on the second and fourth Wednesdays of each month from the opening date of school each year to the close. Special meetings may be called at the discretion of the president.

ARTICLE VIII—QUORUM.

Seven members shall constitute a Quorum.

ARTICLE IX—FISCAL YEAR.

The fiscal year of the branch shall be from the first of January until the first day of January of the following year.

ARTICLE X—ELECTIONS.

The officers shall be elected by ballot by a majority, at the last meeting held in December and shall be installed at the first meeting held in January, and shall serve for one year or until their successors shall have been elected. Nominations for officers shall be made at a meeting previous to the meeting at which the election is held.

ARTICLE XI—PRESIDING OFFICERS.

In the absence of the president, the next succeeding officer shall take the chair.

ARTICLE XII—SECRETARY.

The secretary shall keep fair and correct minutes of the proceedings of the meetings and send reports of the same to the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION as often as is required, and to such journals and newspapers as he may deem proper. He shall preserve on file all reports and papers of every description presented to the Branch, and shall be charged with the necessary business and scientific correspondence. He shall read all papers handed to him by the president for the purpose, shall call and record ayes and nays, whenever they are required to be called; shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues and stating the business upon which the committee is to act. He shall notify every member at least one week in advance of the time and place of each meeting.

ARTICLE XIII—TREASURER.

The treasurer shall collect and take charge of the funds of the Branch and shall give receipts for the same. He shall pay no money except upon order of the secretary countersigned by the president and accompanied by the proper vouchers. He shall present a statement of conditions at each December meeting of the Branch. He shall receive the amount of his expenses incident to the duties of his office.

ARTICLE XIV—ORDER OF BUSINESS.

(1) Reading of the minutes of the previous stated meeting; (2) Introduction of newly elected members; (3) Unfinished or deferred business; (4) New business; (5) Program; (6) Nominations and elections; (7) Adjournment.

ARTICLE XV—MISCELLANEOUS.

Every proposition to alter and amend these By-Laws shall be submitted in writing at a stated meeting of the Branch, and may be ballotted for any subsequent stated meeting when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

ARTICLE XVI—RULES OF ORDER.

On all points not specifically mentioned in the By-Laws governing this section, the By-Laws of the AMERICAN PHARMACEUTICAL ASSOCIATION shall take precedence over the other decisions on parliamentary rule.

(*Motion No. 40*) *It is moved by Kelly that the application for the formation of the State College of South Dakota Student Branch, A. Ph. A., and the Constitution and By-Laws of the Branch be approved.* If any member wishes to discuss this motion, the vote will be considered as tentative.

113. Prescription Ingredient Survey. In order to establish an accurate basis for admissions to the National Formulary, Chairman Gathercoal, with the approval of the Committee on National Formulary, has proposed two surveys, one to determine the number of physicians' prescriptions compounded annually in the United States, omitting prescriptions for alcoholic liquors, and another to determine the ingredients used in these prescriptions. A number of surveys have been made heretofore but none sufficiently extensive to be dependable for the purpose in view.

The first survey is now in process and is being made with the coöperation of the Conference of Pharmaceutical Law Enforcement Officials and various individuals and with the advice of officials of the Bureau of the Census. Dr. Gathercoal first made such a survey in Rockford, Ill. Under Chairman Swain's direction, a complete survey of Maryland has just been completed. Surveys are now in process in three counties in widely varying sections of the country and additional surveys will be continued until sufficient data are collected to give an accurate basis for calculating the number of prescriptions for the entire country. It should be stated that the pharmacists and pharmaceutical officials in the areas being surveyed are giving splendid cooperation and that the cost of this survey, therefore, will be very small.

The survey of ingredients as proposed has been approved by Chairman Cook and the Committee of Revision of the U. S. P. and the Board of Trustees have approved an appropriation of $500, representing one-half of the estimated cost, so that the survey will be a joint N. F. and U. S. P. effort. In this survey considerable volunteer coöperation will be secured but certain forms have to be prepared for tabulating, the tabulating must be done by experienced workers, and the printing of the result will be necessary. The two surveys should make available information of great value to the U. S. P. and N. F. and to professional pharmacy. It is hoped that these efforts may be continued at a very nominal cost after they are once established and provide accurate information as to prescribing.

Chairman Gathercoal requests that an expenditure not to exceed $500 be approved for the last-mentioned survey.

(*Motion No. 41*) *It is moved by Kelly that the Prescription Ingredient Survey be approved at an expenditure not exceeding $500.*

114. Annual Joint Meeting, Executive Committee, N. A. R. D. and Council A. Ph. A. Arrangements have been made for this joint meeting which will be held in Parlor A, Hotel Columbus, Miami, Florida, on Tuesday, July 28th, at 2:30 P.M.

115. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received:

No. 429, Ernest Berger, 301–303 First National Bank Bldg., Tampa, Fla.; No. 430, S. O. Clinton, 106 North Main St., Butte, Mont.; No. 431, Samuel Gottfried, 226 J. St., Sacramento, Calif.; No. 432, L. Arnold Kuhlman, E. Grand Blvd. & Palmer Ave., Detroit, Mich.; No. 433, Walter L. Morgan, 1300 W. Third St., Wilmington, Del.; No. 434, Phyllis Janet Rhodes, Stuart, Nebr.; No. 435, Harry Rosen, 1386 C. Street, S.E., Washington, D. C.; No. 436, George B. Vickery, Scotts Bluff, Nebr.; No. 437, Geo. A. Watson, 4403 Tireman Ave., Detroit, Mich.; No. 438, R. A. Williams, 1200 East Washington St., Orlando, Fla.

(*Motion No. 42*) *Vote on applications for membership in the American Pharmaceutical Association.*

116. Applicants for Membership on Account of Contribution to the Headquarters Building Fund. The following non-member of the A. PH. A. has pledged $25.00 or more to the Headquarters Building Fund and has made a cash payment of $5.00 or more. He is entitled to membership and you are requested to vote on the application which has been properly endorsed.

H-27, L. C. Rettaliata, 2200 N. Charles St., Baltimore, Md.

(*Motion No. 43*) *Vote on application of contributor to the Headquarters Building Fund for membership in the American Pharmaceutical Association.*

E. F. KELLY, *Secretary.*

REPORT ON ENFORCEMENT OF CANADIAN ANTINARCOTIC ACT.

The Narcotic Division of the Department of Pensions and National Health, Ottawa, recognizes three different types of narcotic addicts, namely, those who have developed the habit as the result of medical treatment; those who have become addicts through using narcotic drugs to mitigate the results of overwork, nervous strain, etc., and who occupy good positions in the community, and the underworld addicts of the criminal type.

The report makes a conservative estimate of 8000 addicts which number, it is pointed out, includes all those who are suffering from various painful and incurable diseases which require continued administration of narcotics.

An outstanding feature of the report is the fact that it was necessary to institute proceedings against only one retail druggist. Canada has about 3500 drug stores.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

Article III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

DETROIT.

The April meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the Y. M. C. A. Building, April 21, 1931.

Professor Preston H. Scott was scheduled to speak. Later, he was to conduct a debate on the chain store and take the side of the chain, the assembly was to take the side of the independent; however, Professor Scott was indisposed that evening and Fred F. Ingram, Jr., was called upon to conduct the debate in the place of Professor Scott. While Mr. Ingram is by no means a champion of the chain store, he conducted the debate on the side of the chain, laying particular emphasis upon the following facts: That the chain store has the organization, it has the capital to buy and select locations and take loss for indefinite periods on these locations until competitors are eliminated; and, as compared with these advantages, the discussion brought out the fact that the independent stores have the advantages of the personality of owner management where the personal contact of the owner with the customer is an advantage that cannot be over-come by the chain system.

The chief mistake of the independent stores, Mr. Ingram pointed out, is in the belief that success depends upon buying power, whereas it is selling power that determines success. Although Mr. Ingram is a friend of the independent he led the discussion on the side of the chain in order to bring out a good comparison. Messrs. J. H. Webster, Leonard A. Seltzer, Clarence A. Weaver, defended the policy of the chains and James Liddell led the discussion in behalf of the independent.

During the business session, Leonard A. Seltzer, Dean R. T. Lakey, E. P. Stout and Edward H. Kraus were selected to serve as a nominating committee to report at the May meeting to be held in Ann Arbor, Tuesday evening, May 12th.

BERNARD A. BIALK, *Secretary.*

NEW YORK.

The May meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the College of Pharmacy, Columbia University, on Monday, the 11th; there were about 75 members present, of whom a number attended the "Get-Together Dinner" preceding the meeting.

The chair was taken by Vice-President Ernest A. Bilhuber, who called upon the Secretary to present the minutes of the March and April meetings; these were approved. The Secretary pointed out that in view of the fact that the resolution to form a Committee of physicians and pharmacists to institute conferences of the Health professions was carried at the joint meeting of the Branch with the Academy of Pharmacy, President Fischelis suggested that the officers of both of these associations should meet during the summer months to appoint the committee and formulate plans.

Treasurer Turner F. Currens' report was read and accepted.

Chairman Lehman, of the Committee on Education and Legislation, reported that the bills which the New York State Pharmaceutical Association had introduced into the State Legislature were not carried. The State Association would try to introduce them again next year and at its annual convention in June would decide upon its legislative program for the coming year.

Chairman Mayer, of the Audit Committee, stated that he had approved of the bills which had been submitted to him.

Chairman Dandreau, of the Membership Committee, said that he would endeavor during the coming winter to make student membership a prominent feature.

Dr. Bilhuber pointed out that science students of the universities and technical schools took a great interest in the activities of the local branch meetings of the American Chemical Society and turned out in large numbers to its meetings. He felt that the students of the pharmacy Colleges in New York City would likewise profit greatly by attending the meetings of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, and should be urged to do so.

The Secretary reported that he had received applications for full membership in the Branch from Messrs. Peter C. Anselmo, Joseph Brenner, Alfred B. Kent and Leonard Rose. These were approved.

In the absence of Dr. Schaefer, the Secretary read his report as Chairman of a Committee appointed to consider the advisability of the Branch again becoming affiliated with the New York Pharmaceutical Conference. Dr. Schaefer, for stated reasons, suggested that the question of Conference affiliation be dropped. The Branch voted to accept the suggestion.

In another report from Dr. Schaefer, as Secretary of the Remington Medal Committee, he said that at the present time no recipient for the medal could be declared.

At the request of President Fischelis it was decided to hold over the consideration of his recommendations before the Branch until the next meeting.

The Secretary reported that he had recently received a letter from E. G. Eberle, Editor of the JOURNAL, in which he pointed out that the AMERICAN PHARMACEUTICAL ASSOCIATION is seeking additions to the Library and gifts for the Museum of the American Institute of Pharmacy soon to be erected in Washington, D. C. This affords an opportunity for preserving historical material that would otherwise become lost, as letters, books, photographs, prints, apparatus, etc. The Institute also affords an opportunity for endowments and memorials.

The business section of the meeting was concluded by directing the attention of the members to the arrangements for the Annual Convention of the AMERICAN PHARMACEUTICAL ASSOCIATION at Miami, during the week of July 27th.

Chairman Lewis N. Brown, of the Committee on the Progress of Pharmacy, read a report on recent remedies and advances in pharmacy; he mentioned a new type of vanishing cream formula, Irradol Malt, Theelin, Idozan, Iodeol and Tricalcine; he spoke of the use of triangular bottles for *all* poisons, as proposed by the Board of Aldermen of Montreal, Canada; he referred at length to Dr. P. A. Foote's article entitled "Some Features of the Progress of Medicine in Fifty Years—1880–1930," which dealt chiefly with advances in medical education, and he suggested how advances might be made in pharmaceutical education along similar lines.

Dr. Bilhuber then introduced the speaker of the evening, Dr. C. W. Ballard, Microanalyst to the Bureau of Foods and Drugs of the Health Department of the City of New York and Associate Professor of Materia Medica, Columbia University, College of Pharmacy; the subject of his address was "Experiences as a Microanalyst of Foods and Drugs."

Dr. Ballard opened his remarks by saying that the average citizen knows little about the regulatory work of the Bureau of Foods and Drugs of the Health Department. This Department, with a chemical laboratory staff of 20 persons, analyzed between 50,000 and 60,000 samples a year, about 90% of these being food samples and the remainder drug samples. His own special work for the Bureau was the microscopical examination of food and drug products for which no routine chemical analysis seemed applicable; samples submitted to him were very varied in character, ranging from drugs and cosmetics to oysters and lobsters.

He exhibited many samples of malted milk and explained that he had worked out a method for distinguishing between a genuine malted milk and a dried milk mixed with dry malt extract and other ingredients; he referred to the scare during the War in regard to ground glass in foodstuffs and said that out of 278 miscellaneous food items which he had examined, only 7 contained glass, though 123 showed the pres-

ence of sand. An interesting assignment to him had been oysters grown in Jamaica Bay, found to be colored; it was found that the color was due to dyes entering the water from a near-by dyeworks; as a result of this, oysters from this bay could no longer be sold. He had examined many samples of sausage and found that the addition of starch or cereal as a filler caused the absorption of 5 to 20 per cent more water than was absorbed by sausage containing only the permitted ingredients; it also made the sausages hold their plumpness several days longer. He had dealt with over 1500 samples of coffee, finding that many of them contained chickory or roasted breadstuffs or cereals; there is no objection to these ingredients provided that their presence is mentioned on the label, but many labels were found to be very misleading.

Dr. Ballard went to considerable length to explain how samples of drugs were collected from drug houses and pharmacies and pointed out that as far as the pharmacist was concerned, the greatest error was that of carelessness in labelling, *e. g.*, Tilia flowers which were chiefly leaves, Caraway for Anise, American Saffron (Carthamus) for Saffron N. F. (Spanish Saffron), etc. He said the Department held that the pharmacist is absolutely responsible for the drugs he sells, even though purchased from a wholesaler or jobber in a packaged form. Finally, he pointed out that food and drug adulterants have gone out of use before they reach the publication stage in textbooks.

Dr. Joseph L. Mayer complimented Dr. Ballard on his excellent talk and told of some of his own experiences in the examination of food and drug samples.

Mr. Seley, Dr. Lichtman and others took part in the discussion which followed, a rising vote of thanks was accorded to Dr. Ballard, and the meeting adjourned.—HERBERT C. KASSNER, *Secretary*.

PHILADELPHIA.

The May meeting of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION, was held in the Sharp and Dohme-Mulford Laboratories, Glenolden, Pennsylvania, on Tuesday evening, May 12, 1931.

The Delaware Pharmaceutical Society and the Graduating Classes of the Philadelphia College of Pharmacy & Science and of the School of Pharmacy, Temple University, were the guests of the Branch on this gala occasion. The meeting was in the form of an "Introduction Party" for the graduating classes of both institutions.

President Munch called the meeting to order. Reading of the minutes of the April meeting was waived due to previous publication.

Proposed changes in the by-laws of the Branch were discussed, since their proposal was dated as of the April meeting. On motion each proposed change was voted on and passed. The following now constitutes that portion of the by-laws affected by the change, by which the Branch will be governed in the future:

BY-LAW NO. 1. "*Members*—This Branch shall consist of active, associate and honorary members."

BY-LAW NO. 3. "*Associate Members*—All members of the AMERICAN PHARMACEUTICAL ASSOCIATION in good standing, residing in or within a radius of seventy-five miles of the county of Philadelphia, shall be accredited as being associate members of this Branch, but shall not have the right to vote."

BY-LAW NO. 4. "*Honorary Members*—Any person, who is not an active member, and who shall assist the Branch by the contribution of scientific papers, work or research, or add to its financial resources, shall be termed as an honorary member, but without the right to vote."

BY-LAW NO. 10. "*Dues*—Every active member of the Branch shall annually contribute the sum of one dollar." Amendment—"Every active member who shall be in arrears in the payment of annual dues for two years or more, shall be transferred to associate membership, but may regain active membership upon payment of said dues."

Chairman Slothower presented the following names for Branch Membership: Dr. R. R. Read, Dr. Walter H. Hartung, L. L. Miller, F. W. Dickson and J. J. Farley. On vote each name presented was duly elected to Branch Membership.

Dean J. W. Sturmer was presented by President Munch as the first speaker of the evening and in his characteristic way soon won the undivided attention of all present. His subject was "Proposed Methods of Student Instruction," as suggested by various Colleges to meet the requirements of a specialized age.

Dr. Frank Eby next responded and stressed the necessity of having more joint meetings with the various student groups to interest them in Association work, so that after graduation such work might be carried on in an un-

interrupted manner, resulting in profitable returns for all participants.

Walter L. Morgan, spokesman extraordinary and prominent Wilmington pharmacist, answered his summons to speak by reviewing some of his experiences gathered during his "forty years apprenticeship" as a retail pharmacist. His talk was not only instructional in indicating the trend pharmacy has taken during the past years, but most entertaining, due to the interjection of numerous witticisms which provoked gales of laughter and endeared him not only to his fellow Society members who escorted him to Glenolden, but to everyone present.

On motion the meeting adjourned.

Chairman Harrisson of the Entertainment Committee then took charge, directing the assemblage to the first floor, where a generous surprise in the form of refreshments and music had been arranged.

W. J. STONEBACK, *Secretary.*

STUDENT BRANCH OF THE A. PH. A. SCHOOL OF PHARMACY, STATE COLLEGE OF WASHINGTON, PULLMAN, WASHINGTON.

A new student branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was formed at the School of Pharmacy at the State College of Washington on March 16th. The Association has thirty-two members, twenty-eight students and four faculty members, and has elected the following persons to office:

President, Harleigh Lines; *First Vice-President,* Miss Marlowe Dittebrandt; *Second Vice-President,* Wallace Lindahl; *Secretary and Treasurer,* Miss Belle Wenz, of the faculty.

The meetings are to be held on the first and fourth Thursdays of each month. The first regular meeting of the branch was addressed by Dean Dirstine. The secretary read Dr. Beal's address entitled, "The Work, Principal Purposes and Ideals of the AMERICAN PHARMACEUTICAL ASSOCIATION." The president appointed the following chairmen to act on the standing committees for the year:

Professional Relations Committee, Max Marr.

Student Activities Committee, Paul Luft.

Entertainment Committee and Program Committee, Elsie Anderson.

Membership Committee, Claude Messer.

Dr. Robert Stier, of the Hollister-Stier Laboratories of Spokane, Washington, addressed the students at their second meeting. Dr. Stier spoke on "Food Allergy and Hay Fever." This lecture was illustrated and proved to be very instructive and interesting.

The third meeting was addressed by A. H. Ekman. He is the buyer and has charge of the sundry division of the McKesson-Spokane Drug Company, of Spokane. He gave a most excellent address on "Retail Buying and Merchandising."

Ronald Robertson, of Whitlock's Exclusive Prescription Store in Spokane, spoke to the group at the last meeting, held May 7th. Mr. Robertson gave a most instructive address on the "Exclusive Prescription Pharmacy," contrasting its methods, stock and service with the ordinary retail store. Mr. Robertson is a proprietor of one of the finest exclusive prescription stores in the United States and has the honor and distinction of being the youngest man to serve on the Washington State Board Examining Committee, of which he is now a member.

INVITATIONS TO COMMENCEMENT EXERCISES OF COLLEGES AND SCHOOLS OF PHARMACY.

The schools and colleges of pharmacy holding their commencement exercises during the present month have sent invitations to this office for these annual events. It is not possible to speak of these institutions separately but to all of them appreciation is expressed for the thoughtfulness of the institutions in sending the invitations and with all good wishes for the advancement of pharmacy. The programs are exceptionally interesting and all of them indicate the progress being made by pharmacy. The editor had the opportunity of attending one of these functions only, namely, that of Maryland University, a most delightful occasion.

TULANE UNIVERSITY WILL CONTINUE PHARMACY SCHOOL.

Several months ago it was announced that Tulane University would discontinue its Pharmacy School, but after consulting with Louisiana Pharmaceutical Association and the Louisiana Board of Pharmacy and with Tulane Alumni Association, it has been decided to continue the school. Prof. John F. Simon has been elected Dean of the School.

EDITORIAL NOTES

Editor: E. G. Eberle, 10 West Chase Street, Baltimore, Md.

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PRESCRIPTION DISPENSING OF THE UNITED STATES.

Wroe Alderson, chief business specialist of the Department of Commerce, was one of the speakers at the American Pharmaceutical Manufacturers' Association, at its meeting in French Lick, Ind., during the week of May 26th. He stated that between $90,000,000 and $135,000,000 are spent by the American people for the 120,000,000 to 180,000,000 prescriptions which it is assumed are filled annually in this country. This prescription business is divided among approximately 60,000 drug stores. Mr. Alderson stated that if there was sufficient prescription business to keep the pharmacists busy they would be able to fill approximately 2,160,000,000 prescriptions in the course of the year. In other words the capacity for filling prescriptions is more than ten times as great as the total number of prescriptions filled. He stated that data gathered in St. Louis indicate that of the more than 600 drug stores in the state nine pharmacies of the professional type handle fully one-fourth of all the prescriptions filled. The preliminary analysis of the survey being carried on in St. Louis indicates that the typical pharmacy is generally well supplied with all the medicines most frequently prescribed and contrary to the usual belief very few rare or obsolete drugs are carried in stock.

Mr. Alderson said that the analysis of prescriptions is only one of a number of phases of the very comprehensive project being conducted in St. Louis. It is expected to present some very definite findings on store arrangement through investigation of the advantages and disadvantages found in operation in drug stores. Other phases will deal with methods of drug store merchandising, window display, advertising, store location and other details which are included in the druggists' problems.

For the purpose of gathering data for guidance in the revision of the U. S. Pharmacopœia the extent of prescription practice is being studied, and under the direction of Dr. R. L. Swain a survey has been made in Maryland, which includes nearly all of this service in the State of Maryland; and this has been followed by an analysis of the prescriptions in a sufficient number of drug stores for basing, not only the number, but components of the prescriptions, a service of distinct value.

DEVELOPMENTS IN HEALTH CONTROL OF EGYPT.

The Public Health Department of the Egyptian Government is outstanding in its recent expansion and intensive methods of combating disease. This department has been particularly active in attempting to check the spread of disease between the Asiatic and western countries. In addition to other methods of control in connection with transportation, quarantine stations for travelers by air now exist. Many thousands making the annual pilgrimage to Mecca are compelled to submit to vaccination against smallpox and cholera before leaving the country and before returning must undergo a quarantine period for cholera at Al-Tar, a quarantine station on the eastern shore of the Gulf of Suez. During 1926 and 1927, more than 14,000,000 people out of a total population of 15,000,000 were vaccinated against smallpox.

A new Pasteur Institute was recently established; also a new mobile laboratory for investigation of outbreaks of disease in villages. Provincial laboratories have been erected in Luxor, Asyut, Suez, Port Said and Alexandria for bacteriological investigation of disease. An institute of hygiene has been created for the training of sanitary inspectors. In three years 16 general hospitals and 28 village hospitals have been completed. There is a total of 35 ophthalmic hospitals, of which 21 are permanent and 14 traveling. In addition to hospitals, there are 14 clinics for the treatment of venereal disease. Several tuberculosis clinics have been established. A sanitorium containing 135 beds was opened in 1927 at Helouan.

For the treatment of *bilharzia* and *ankylostomiasis*, with which the agricultural population is heavily infected, there are traveling tent hospitals. There are 40 traveling child welfare clinics.

Among numerous future projects contemplated is the establishment of a new tuberculosis sanitorium intended to be the nucleus of a tuberculosis colony and the creation of a leper colony.

PRODUCTION OF CITRIC ACID.

H. T. Herrick, Principal Chemist in Charge and O. E. May, Chemist, Bureau of Chemistry and Soils, Department of Agriculture, in a report on the production of citric acid, refer to the fact that while the employment of molds in the production of foodstuffs is of very ancient origin, their utilization in the chemical industries has lagged far behind that of yeasts and bacteria, for the outstanding example of such employment was discovered as recently as 1890, and not translated into factory procedure until within the last five years. A German scientist first discovered that a certain variety of mold, when grown on cane sugar solutions, would produce citric acid. He gave the name of citromyces to his mold and took out patents to cover his discovery. When, however, an attempt was made to go from laboratory to factory scale, so many difficulties were encountered that the project was abandoned. For the next 20 years the work on this problem was chiefly confined to the laboratory, then an investigation was undertaken at the United States Department of Agriculture which led to the discovery of a different mold, better adapted to the production of citric acid from cane sugar. After several years of laboratory work, the results were published and the project was taken into industry for trial there. Ten more years were necessary before the process emerged in a finished industrial form, but it is now in operation so successfully that Italian citric acid (the natural variety), has been driven from the American market, and even in Europe is on the defensive against the synthetic product. The total production of citric acid by this process is not known, but it is variously estimated as between five and ten million pounds.

DENTAL CEMENTS.

Analyses of various dental cements show that the powder consists of either zinc oxide or alumina and silica, or of a mixture, the fluid being phosphoric acid or a solution of acid zinc phosphate. All depend for their setting on the production of a phosphate gel. The plastic qualities depend on the fineness of division of the powder and the viscosity of the liquid. The authors have investigated new cements in which various oxides formed the powder and silico fluorides the liquid. Good results were obtained with zinc oxide or alumina and zinc fluosilicate. The zinc oxide cement gave quicker setting and greater final strength. The reaction of formation is $ZnSiF_6 + 2ZnO = 3ZnF_2 + SiO_2$. Another new cement is prepared by heating to 1400° 1 mol. of lanthanum oxide (La_2O_3) and 2 mols. of silica and mixing with phosphoric acid or acid zinc phosphate. The qualities of this cement are equal to those of standard dental cements.—O. Ruff, C. Friedrich and E. Ascher (*Z. Angew. Chem.*, 43 (1930), 1081–1087, through *B.C.A.-B.*, January 30, 1931).—*Jour. & Pharm.*, 72 (1931), 283.

PERSONAL AND NEWS ITEMS.

Resolutions were adopted by the Michigan Legislature citing the accomplishments and contributions to medicine and chemistry of Dr. Frederick G. Novy, professor of bacteriology, University of Michigan Medical School, Ann Arbor; Moses Gomberg, Sc.D., professor of chemistry, University of Michigan, and Reuben L. Kahn, Sc.D., who devised the Kahn precipitation test. The ceremony was attended by Gov. Wilber M. Brucker, Henry Ford, the Supreme Court justices, and other state officials and many physicians. Governor Brucker, in opening the program, stated that

the idea had been originated by Dr. James T. Upjohn, chairman of the Senate public health committee.

Ura O. Musick, of Colorado Springs, has been appointed a member of the Colorado State Board of Health. He received the endorsements of pharmacists and physicians for the place. Colorado now enters the lines of a number of other states having a pharmacist on the State Board of Health.

We were pleasantly surprised last month by a visit from pharmacist **John Cameron** of the Peiping Union Hospital, who recently made a partial tour of the world. In his journeys he took notes of the status of pharmacy and contributed a report to the *Pharmaceutical Journal and Pharmacist*. Before leaving he promised to give the JOURNAL a related account of his visit in Canada and the United States.

Dr. John R. Minehart, dean of Temple University School of Pharmacy, is recovering from a surgical operation and is attending to his duties again.

Walter D. Adams, president of the AMERICAN PHARMACEUTICAL ASSOCIATION, and James M. Pendland, president of the National Wholesale Druggists' Association, were honored at a dinner June 6th at the Adolphus Hotel by the Dallas County Retail Druggists' Association, Ladies' Auxiliary, and Drug Travelers' Association. **Walter H. Cousins,** Secretary of the Texas Board of Pharmacy, presided as toastmaster.

Former President **L. L. Walton** of the AMERICAN PHARMACEUTICAL ASSOCIATION recently delivered a lecture before a graduating class of the Philadelphia College of Pharmacy and Science on "The Legal Phases of the Practice of Pharmacy and Sale of Drugs and Poisons." Mr. Walton is completing his 25th year as a member of the Pennsylvania Board of Pharmacy; his long experience with the pharmacy laws enables him to speak with authority on the subject.

Two mural paintings were unveiled and dedicated at the Philadelphia College of Pharmacy and Science on June 8th. These two murals are the first and last of a series of these paintings depicting the progress of pharmacy, and have been painted by William F. Matthews of Brooklyn, N. Y. The first of the series representing the beginning of pharmacy has been presented by Mrs. Charles H. LaWall and Miss G. H. Renshaw in memory of their father, Thomas W. W. Renshaw, a retail pharmacist who died in 1904.

The last one of the series representing modern pharmacy has been presented by Dean Charles H. LaWall in memory of his father, John Jacob LaWall, a retail pharmacist 1843–1896.

The presentation was made by Col. Samuel Price Wetherill and the murals were accepted on behalf of the college by President Wilmer Krusen.

Dr. Townes R. Leigh, member of the AMERICAN PHARMACEUTICAL ASSOCIATION and head of the Department of Chemistry and Dean of the College of Pharmacy of the University of Florida has been appointed Florida State Chemist by Governor Doyle E. Carlton. During the World War Dr. Leigh invented the Leigh fog screen for the protection of vessels against submarines.

Ira W. Rose, for a number of years member of the North Carolina Board of Pharmacy, has been appointed a member of the teaching faculty of the School of Pharmacy of the University of North Carolina.

Erwin M. Joseph has been elected president of the Texas State Board of Pharmacy. He has been a member of the Board for the last six years and was *Vice-President* during the last two years.

The *Washington Post*, of May 31st, paid deserved tribute to the activity of Surgeon General Ireland, who recently retired. In speaking of him the article states "General Ireland is a bundle of energy, lightning quick in his decisions, and bustling in his manner." The article throughout speaks of the high regard in which the former Surgeon General is held.

Publicity bulletins of manufacturers evidence deep interest in professional pharmacy—they emphasize that "it is one of the proud boasts of Pharmacy that it coöperates with physicians and health authorities in guarding and promoting public health." The coöperation of manufacturers is most helpful.

Dr. R. L. Swain presented an instructive paper before the recent Economic Conference at the Philadelphia College of Pharmacy and Science on "What Can Be Done to Prevent the Sale of Active Therapeutic Substances by Those Not Qualified by Law." A keynote of his address was that professional recognition depends largely on professional activity and behavior.

In his inaugural address Governor Albert C. Ritchie asked "Does business want a minimum of government interference?" "Very well,"

he answers, "it can deserve and gain this freedom only by developing a higher order of self government and by tackling those problems which are of its own making instead of passing them on to government."

Rear-Admiral Bradley A. Fiske, retired, has sided with General MacArthur in his criticism of certain clergymen.

"My opinion," he said, "may be briefly expressed by saying that their significance is about the same as would be the replies of those 19,000 clergymen concerning proposed cures of cancer."

Admiral Fiske has stated a truth which applies in other activities. The following statement has been made in these pages, in another connection and is relevant. ... "The deduction is that men of different professions may work together, but each class is best qualified to render service in the department for which the individuals have been trained by experience and education." The same thought was expressed and put into practice by Dr. John Morgan about 200 years ago.

The New York Pharmacist for May is an interesting number in which much attention is given to State Association matters; an important article is that on "Physician and Pharmacist," by H. V. Arny—it is the first of a series to be continued by other authors.

The Hudson County Retail Druggists Association has adopted a series of resolutions and articles which are being submitted to State associations for consideration. The resolutions are entitled "Prescription Department," "Advertising of U. S. P. and N. F. Preparations," "Combination or Companion Deals." Discussions on the subjects are included, all of them of interest to pharmacists.

In a recent report, Surgeon General H. S. Cumming of the Public Health Service indicates that the year ended June 30, 1930, has been characterized by additional legislation seeking to coördinate and crystallize the functions of the Narcotics Division, now designated by law as "Division of Mental Hygiene."

In the "Magazine Section" of *New York Times* S. J. Woolf sketches **William Jay Schieffelin** as a veteran crusader, whose interest in civic affairs exemplifies his belief that each citizen should perform his civic duties, and that the failure of graft inquiries is the result of citizens ignoring their duties. The wholesale drug firm of Schieffelin & Co., with minor changes in title, has been in existence since 1794. Mr. Schieffelin is a former president of the National Wholesale Druggists' Association.

BRITISH CHEMICAL PLANT EXHIBITION.

The arrangements for the representative Exhibition of British Chemical Plant and Equipment which is to be held at Central Hall, Westminster, London, during the week of the Jubilee Celebrations of the Society of Chemical Industry from July 13th–18th, inclusive, are now practically complete. The whole of the available space has been booked with the greatest ease, thus showing the wide appeal which the Exhibition has made to owners of British chemical plants. Some fifty firms, among whom are the most important plant manufacturers in the country, will be exhibiting a wide range and variety of products.

OBITUARY.

CHARLES GIETNER.

Charles Gietner, prominent pharmacist of St. Louis, member of the AMERICAN PHARMACEUTICAL ASSOCIATION for thirty years and charter member of the N. A. R. D., died at his home May 17th, aged 65 years. The deceased was a native of St. Louis.

Mr. Gietner, an alumnus of the St. Louis College of Pharmacy, was known as the "father of its alumni association" and served as the treasurer since 1890. In all movements for the betterment of pharmacy he took a leading part and missed only a few of the annual meetings of the A. PH. A.—He was known as "the grand old man of Missouri pharmacy."

Mr. Gietner was active in the Masonic bodies; funeral services were held at Masonic Temple. He is survived by his widow.

Jacob Schrodt, a former president of Texas Pharmaceutical Association and prominent pharmacist, died at his home in Terrell, May 24th. He was an alumnus of Chicago College of Pharmacy, class of 1899.

Dr. Alfred Scott Warthin, noted pathologist, author and director of the University of Michigan pathological laboratories, died May 23rd, aged 66 years.

SOCIETIES AND COLLEGES.

SEVENTY-NINTH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, COLUMBUS HOTEL, MIAMI, FLA., JULY 27TH TO AUGUST 1ST.

Business Sessions.—See the General Program in Council Letter No. 10, May JOURNAL, page 505, for Business Sessions and Entertainment Features.

Entertainment Features.—The object of the Florida pharmacists has been to furnish entertainment for every hour that will not conflict with the business sessions or with necessary rest. They want to have the visitors see their wonderful section and enjoy its special attractions as fully as possible. The Local Committee requests that visitors register promptly so that all may be included in the various events, and offer their services in arranging for trips outside the official program. Entertainments are provided for the ladies during the business sessions. The dates were selected so that the meeting would occur at full moon, as the tropical moonlight adds greatly to the beauty of the scenery.

The banquet will be held at the Coral Gables Country Club—outdoor dancing by moonlight following. Governor Doyle E. Carlton and Mrs. Grace Bryan Owen, Congresswoman, will be among the speakers. This Club is noted for the beauty of its surroundings and for its wonderfully planted Spanish Gardens with a special dance floor amid the palms.

"The Night in Dixie" is a typically Southern entertainment and will be held in the City Park facing Biscayne Bay. There will be a special outdoor musical and minstrel program followed by street dancing in the moonlight—something to be remembered.

Transportation.—Information relative to Transportation is given elsewhere in this issue of the JOURNAL, which see. The following is repeated and additional: Low-rate round trip excursion tickets good for 30 days and with stop-over privileges from Northern and Western points bordering on and outside of the Southeastern Passenger Association Territory. If this ticket is not available at any station, a "Local Ticket" may be bought to some point where it is sold. **See your R. R. agent.**

Identification certificates will be distributed to A. PH. A. members, and can be obtained from the Secretary's office, 10 W. Chase St., Baltimore. *The dates for this ticket cover the time of meeting of the Plant Science Seminar, and members attending the Plant Science Seminar can stop over at Gainesville.*

Further Information Relative to Trips by Water.—Those traveling by boat or by rail and boat should inquire promptly about special excursion rates and stop-over privileges. The boat trips to Miami afford a splendid vacation and rest, and some may wish to continue the trip to Bermuda, the Bahamas and other places. The boat lines to points in Florida and nearby states include the following: Clyde Line: New York to Miami, Jacksonville and Charleston. Merchants and Miners Steamship Company: Philadelphia and Baltimore to Jacksonville. The Savannah Line and the Ocean Steamship Company: various ports to Savannah. Lines from New Orleans and other gulf ports to Miami. The steamship lines do not offer a special rate to our meeting, but low summer excursion rates are in effect on most of them. We are informed, for instance, that the Clyde Line has a summer rate, including stateroom and meals, from New York to Miami and return, of $75.00; New York to Jacksonville and return, $55.50, with low rates on automobiles accompanied by passengers.

Please look up other notices in other sections of this issue regarding rates and routes.

The Local Secretary, Mr. G. H. Grommet, 2364 S. W. 11th St., Miami, Fla., will be glad to coöperate with any visitor in arranging for trips either before or after the meeting.

The Dade County Retail Druggists Association and the Florida Pharmaceutical Association have charge of the meeting and plan to make it an outstanding event in the experience of the host of visitors they expect to entertain. The Florida Association will hold its annual meeting in Miami during the same week. The State and City authorities, as well as the Chambers of Commerce and other organizations of the State, are giving every possible cooperation.

The members of the Convention Committee are: *Chairman*, J. K. Clemmer; *Secretary*, G. H. Grommet; *Treasurer*, I. Cliff Smith; A. Finstad and B. B. Freeland.

The Committee Chairmen are: *Reception*, H. Jackson; *Hotels*, A. Finstad; *Finance*, I. Cliff Smith; *Registration*, Chas. Liles; *Publicity*, G. E. Burwell; *Program*, R. Hailey; *Entertainment*, Lee McGarr; *Ladies*, E. W. Groover; *Veterans*, E. W. Stucky; *Member-*

ship, Nat Hunter; *Banquet*, Wm. L. Johnson; *Refreshments*, N. C. Edmondson; *Badges*, W. Scheibler; *Transportation*, Lee McGarr; *Advisory*, J. H. Beal; *Association Colleges Pharmacy*, W. J. Husa; *Association Boards of Pharmacy*, N. H. Hunter; *Association Secretaries*, G. E. Burwell; *Law Enforcement Officials*, J. Specht; *Plant Science Seminar*, Wm. Fossett; *Alumni and Fraternities*, Don Smith.

THE SECTIONS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The programs are incomplete and tentative. Contributors to the Sections should send in titles and abstracts of their papers, if not complete, so they can be entered on the official program. This should be done promptly. All of the Sections want more papers.

Scientific Section.

Officers: *Chairman*, E. E. Swanson, % Eli Lilly & Co., Indianapolis, Ind.; *First Vice-Chairman*, L. E. Warren, Bureau of Chemistry, Washington, D. C.; *Second Vice-Chairman*, R. E. Schoetzow, 149 Joralemon St., Brooklyn, N. Y.; *Secretary*, L. W. Rowe, % Parke, Davis & Co., Detroit, Mich.; *Delegate to the House of Delegates*, H. A. Langenhan, Seattle, Wash.

PRELIMINARY LIST OF TITLES FOR THE SCIENTIFIC SECTION, MIAMI MEETING.

"Influence of the Alkaloidal Purification Procedure in the Assay of Alkaloidal Drugs," Geo. E. Éwe.

"The Pharmacognosy, Chemistry and Pharmacology of Viburnum. III. Viburnum Opulus var. Americanum. Its History, Botany and Pharmacognosy," H. W. Youngken.

"The Hydrogen-Ion Concentration of the Infusion of Digitalis," John C. Krantz, Jr.

"A Physical Chemical Study of Solution of Magnesium Citrate," Margarethe Oakley and John C. Krantz, Jr.

"The Relation of Hydrogen-Ion Concentration to Potency in Tincture of Digitalis," John C. Krantz, Jr., and James C. Munch.

"Vein Islets as Means of Identifying Drugs and Detecting Adulterants," C. J. Zufall and Alleda Burlage.

"Ergot—Size *vs.* Potency," B. V. Christensen and A. D. Welch.

"Oregon Ergot," Ernst T. Stuhr.

"A Note on the Titration of Boric Acid," John C. Krantz, Jr., and C. Jelleff Carr.

"A Note on the Assay of Tincture of Ferric Chloride," Margarethe Oakley and John C. Krantz, Jr.

"The Alkaloids of Argemone Alba Lestib," P. A. Foote.

"An Investigation of Oregon Grown Japanese Peppermint," Ernst T. Stuhr.

"The Effect of Various Iodides upon the Stability of Hydriodic Acid," W. J. Husa and P. S. Shattuck.

"The Stabilization of Solution of Arsenous and Mercuric Iodide, U. S. P. X," William J. Husa.

"The Analysis of Arsenous Iodide," William J. Husa.

"The Preparation of a Series of Esters of Dialkylamino Methanols with a Study of Their Pharmacological Action as Local Anesthetics," E. V. Lynn and F. V. Lofgren.

"Some Comparative Observations on Irradiated Ergosterol and Cod Liver Oil," E. O. Prather, Jr., Martha Nelson, and A. R. Bliss, Jr.

"The Strychnine–Brucine Ratio of Nux Vomica, and the Relative Potency of These Alkaloids," R. W. Morrison and A. R. Bliss, Jr.

"Thallium Poisoning in Migratory Birds," Justus C. Ward.

"The Quantitative Determination of Thallium," J. C. Ward and J. C. Munch.

"Studies on Strychnine. III. The Effect of Quinine upon the Taste Threshold of Strychnine," J. C. Munch and J. C. Ward.

"Studies on Strychnine. IV. Further Studies on the Masking of Strychnine Taste by Sweetening Agents," J. C. Ward and J. C. Munch.

"Studies on Strychnine. V. The Masking of Strychnine Taste by Combinations of Sweetening Agents and Inorganic Salts," J. C. Ward and J. C. Munch.

"Antiseptic Value of Ammonia Liniment N. F. V and Acetic Turpentine Liniment N. F. V," H. B. Fenwick.

"On the Occurrence of Azulene in Achillea Millefolium," Katherine Graham and Edward Kremers.

"A Chemical Study of Chenopodium Ambrosioides L. var. Anthelminticum A. Gray," R. J. Pauly and Edward Kremers.

"A Revision of Oxygen Derivatives of Cymene," S. Chechik, W. W. F. Enz, and Edward Kremers.

"A Chemical Study of Corydalis Aurea, Wild," H. F. Eppson and Edward Kremers.

"A Note on the Assay of Spirit of Ethyl Nitrite," W. F. Reindollar and John C. Krantz, Jr.

"Tincture and Fluid Extract of Digitalis," L. W. Rowe and W. L. Scoville.

"Fluid Extract of Ergot," L. W. Rowe and W. L. Scoville.

"Physics in Pharmacy, Part IV," John Uri Lloyd and Wolfgang Ostwald.

"The Oil from the Fruit of Melia Azedarach Linne," Loyd E. Harris and Ralph M. Wilson.

"The Application of Statistical Methods to Pharmaceutical Research. III. The Fitting of Straight Lines to Experimental Data," James C. Munch.

"The Bioassay of Mydriatics and Miotics," James C. Munch.

"The Bioassay of Adonis Vernalis, N. F.," James C. Munch.

"The Bioassay of Apocynum, N. F.," James C. Munch.

"The Bioassay of Convallaria Majalis, N. F.," James C. Munch.

"Further Studies of the Pharmacology of the Viburnums," James C. Munch and H. W. Youngken.

"Alkaloidal Reagents. I. Preparation and Method of Use," James C. Munch, Frank Crossley and Walter H. Hartung.

"Alkaloidal Reagents. II. Systematic Study of the Reaction of Phenols and Amino-Phenols," James C. Munch, Frank Crossley and Walter H. Hartung.

"A Series of Toxicological Investigations. I. Mercury and Lead," L. W. Rising and E. V. Lynn.

"A Series of Toxicological Investigations. II. Cocaine and Morphine," L. W. Rising and E. V. Lynn.

"A Series of Toxicological Investigations. III. Phenol and Iodine," L. W. Rising and E. V. Lynn.

"Resin of Ipomea," L. E. Warren.

"Studies on Aconitum. I. Aconitum Napellus L and Its Varieties," H. W. Youngken.

Section on Education and Legislation.

Officers: *Chairman*, B. V. Christensen, Gainesville, Fla.; *Vice-Chairman*, Rudolph H. Raabe, Ada, Ohio; *Secretary*, C. M. Anderson, Oklahoma City, Okla.; *Delegate to House of Delegates*, Glenn L. Jenkins, Baltimore, Md.

Due to the inability of the secretary to act, titles for papers to be delivered before the Section on Education and Legislation should be sent to either of the undersigned. If titles have already been sent to the secretary, please send them again to either of the undersigned so as to be sure they will be listed on the program.

We hope you will be able to contribute a paper as we still have room on the program. Titles should be sent as early as possible, and not later than July 1st.

B. V. Christiansen, *Chairman*,
U. of Florida, Gainesville, Florida.
Rudolph H. Raabe, *Vice-Chairman*,
Ada, Ohio.

Section on Practical Pharmacy and Dispensing.

Officers: *Chairman*, Ralph E. Terry, 715 So. Wood St., Chicago, Ill.; *Vice-Chairman*, A. Zieffle, Corvallis, Ore.; *Secretary*, W. Paul Briggs, 2121 H St., N.W., Washington, D. C.; *Delegate to the House of Delegates*, H. C. Newton, Omaha, Neb.

"Turbidity Standards for Pharmacopœial Waters and Solutions," Samuel Claman, Jelleff Carr and John C. Krantz, Jr.

"Studies in Filtration of Pharmacopœial Products," John C. Krantz, Jr., and Jeleff Carr.

"The Preparation of Diluted Hydriodic Acid and Syrup of Hydriodic Acid," William J. Husa.

"What Price Professional Pharmacy?" J. Leon Lascoff.

"When and How to Introduce Prescription Compounding," John F. Suchy.

Title later, A. C. Taylor.

"The Quality of Tincture of Digitalis Dispensed by Pharmacists," Robert P. Fischelis.

"The Changing Order of American Pharmacy," Anton Hogstad, Jr.

"The Florida Sponge Industry," Fred H. Heath and P. A. Foote.

"Microscopic Identification of Ephedrine with Nitrous Acid," Frederick Grill.

Visits to Arcade Pharmacy and Fosset's Pharmacy, Miami.

Section on Commercial Interests.

Officers: *Chairman*, Jos. G. Noh, Omaha, Neb.; *First Vice-Chairman*, Rowland Jones, Gettysburg, So. Dak.; *Secretary*, Leon Monell, Buffalo, N. Y.; *Delegate to the House of Delegates*, Denny Brann, Des Moines, Ia.

PARTIAL LIST OF PAPERS.

"National St. Louis Drug Store Survey," Robert L. Lund, Chairman National Committee.

"Revelations—Some Ideas of Stock Control and Turnover," George W. Colborne, Jr.

"Why We Teach Principles of Window Trimming at the College of Pharmacy, State University of Iowa," L. C. Zopf, Instructor in Window Display.

"Average Price of Prescriptions in Columbus, Ohio, and Buffalo, N. Y.," Clarence M. Brown, Assistant Professor of Pharmacy, Ohio State University, and Leon Monell, Associate Professor of Commercial Pharmacy, University of Buffalo.

"Building Business with Professional Windows," Robert J. Ruth.

"Merchandising Pharmaceutical Products Pays," J. J. Nichols, Director, Iodine Educational Bureau.

"Educating Physicians to Prescribe Official Preparations," John L. Dandreau, Dean, St. John's College, School of Pharmacy.

"Work of the Druggist's Research Bureau," Dr. Paul C. Olsen.

"What Is Substitution from a Commercial Pharmacy Viewpoint?" W. Bruce Philip.

"Result of the New York State Economic Committee Questionnaire," Leon Monell, *Chairman*.

Section on Historical Pharmacy.

Officers: *Chairman*, J. T. Lloyd, 300 Court St., Cincinnati, Ohio; *Secretary*, L. E. Warren, Bureau of Chemistry, Washington, D. C.; *Delegate to the House of Delegates*, George D. Beal, Pittsburgh, Pa.; *Historian*, E. G. Eberle, 10 W. Chase St., Baltimore, Md.

Partial List of Papers.

"The Origin of the Historical Section of the A. Ph. A.," *Chairman*'s Address, John Thomas Lloyd.

"The Rise of Organized Pharmacy in West Virginia," Roy B. Cook.

"Golden Jubilee Celebration 50 Years Ago in Kansas," M. Noll.

"Exploring Economic Plants," Ernst T. Stuhr.

"Edward Morrell Holmes, a Reminiscence and an Appreciation," William Wyatt.

"The Librarian's Story," John Uri Lloyd and John Thomas Lloyd.

"Pharmacy and Medicine in Ancient Egypt," L. E. Warren.

"Belladonna Monographs," Fred B. Kilmer.

Subject to Be Announced, Edward Kremers.

Subject to Be Announced, Robert J. Ruth.

"Phytochemic Terminology." An attempt is being made to reveal the evolution of the terms commonly used in phytochemistry. The first instalment explains the following words: Podophyllic Acid by A. H. Uhl; Podophyllotoxin by A. H. Uhl; Picropodophyllin by A. H. Uhl; Paraffin, Edward Kremers and Co-laborers.

"William Lewis," Edward Kremers.

"Philo Carpenter, Pioneer Chicago Pharmacist," William B. Day.

Other papers have come in after completion, will be in next number of Journal.

CONFERENCE OF PHARMACEUTICAL ASSOCIATION SECRETARIES.

Officers: *President*, J. G. Beard, Chapel Hill, N. C.; *First Vice-President*, Walter D. Adams, Forney, Texas; *Second Vice-President*, Charles J. Clayton, Denver, Colo.; *Secretary-Treasurer*, Carl G. A. Harring, Dorchester, Mass. *Executive Committee.*—P. J. Garvin, New Haven, Conn.; J. W. Slocum, Indianola, Ia.; Robert C. Wilson, Athens, Ga.; Rowland Jones, Gettysburg, S. Dak.; W. Bruce Philip, San Francisco, Calif.

Address of President, J. G. Beard.

Report of Secretary-Treasurer, Carl G. A. Harring.

New Business.

Round Table Discussion.

Round Table Discussion (*Concluded*).

New Business.

Subjects of Round Table discussions to be published in convention program.

THIRD ANNUAL MEETING OF THE CONFERENCE OF PHARMACEUTICAL LAW ENFORCEMENT OFFICIALS.

Officers: *Chairman*, R. L. Swain, 2411 N Charles St., Baltimore, Md.; *Secretary*, M. N. Ford, 608 High-Long Building, Columbus, Ohio.

Remarks by Chairman, R. L. Swain.

Report of Secretary, M. N. Ford.

Report of Finance Committee.

"Discussion of Recent Pharmaceutical Legislation," W. N. Ford, Ohio.

"The Practical Benefits from Annual Registration of Pharmacists and Drug Stores," A. L. I. Winne, Virginia.

"A Survey of State Pharmacy Laws with Reference to the Sale of Drugs and Medicines by General Merchants," Robt. P. Fischelis, New Jersey.

"The Board of Pharmacy Should Designate the Medicinal Preparations to Be Sold by General Merchants," P. H. Costello, North Dakota.

"The Legal Significance of the Maryland Prescription Survey," Robt. L. Swain, Maryland.

Other papers and discussions are being arranged.

NATIONAL CONFERENCE ON PHARMACEUTICAL RESEARCH.

(Organized 1922.)

PROGRAM 1931 MEETING, MIAMI, FLORIDA.

Officers: *Chairman*, E. N. Gathercoal; *Vice-Chairman*, William J. Husa; *Secretary*, John C. Krantz, Jr.; *Treasurer*, Philip I. Heuisler; *Members of Executive Committee*, H. V. Arny, L. L. Walton, L. E. Warren.

Monday, July 27th, 9.30 A.M.

1. Call to order by Chairman.
2. Appointment of Nominating Committee.
3. Summary of year's activities and outlook of Conference for the future, by Chairman Gathercoal.
4. Reports of Officers.
   a. Report of Secretary.
   b. Report of Treasurer.
   c. Report of Executive Committee, by Secretary.
5. Reports of Standing Committees.
   (1) Dispensing Pharmacy, S. L. Hilton, *Chairman*.
   (2) Manufacture of U. S. P. and N. F. Galenicals, E. F. Cook, *Chairman*.
   (3) Medicinal Chemicals, Geo. D. Beal, *Chairman*.
   (4) Sources and Identification of Botanic Drugs, H. W. Youngken, *Chairman*.
6. Roll Call of delegates.
7. Presentation of the Symposium: "Fighting Disease with Drugs" to the Conference.
8. Adjournment for luncheon. Arrangements will be made for an assembled luncheon for the delegates.

Afternoon Session, 2.00 P.M.

Continuation of Reports of Standing Committees.

   (5) Chemistry and Standardization of Botanic Drugs, B. V. Christensen, *Chairman*.
   (6) Color Standards and Colorimetric Assays, H. V. Arny, *Chairman*.
   (7) Pharmacology and Bioassays, J. C. Munch, *Chairman*.
   (8) Bacteriology and Biologicals, A. R. Bliss, *Chairman*.
   (9) Pharmaceutical Physics, C. B. Jordan, *Chairman*.
   (10) Education Research in Pharmacy, A. B. Lemon, *Chairman*.
   (11) Business Research in Pharmacy, Ambrose Hunsberger, *Chairman*.
   (12) Historical Pharmacy, C. H. LaWall *Chairman*.
9. Reports of Special Committees.
   (1) Book on Research Achievements, John C. Krantz, Jr.
   (2) Sustaining Members, Philip I. Heuisler, *Chairman*.
10. General Discussion of the Census of Pharmaceutical Research, H. V. Arny.
11. Election and Installation of Officers.
12. Adjournment.

JOHN C. KRANTZ, JR., *Secretary*.

NINTH ANNUAL SESSION OF PLANT SCIENCE SEMINAR, JULY 20–24, 1931.

SECOND ANNOUNCEMENT.

The following tentative program is subject to changes and additions. Suggestions will be gladly received. All meetings in Chemistry-Pharmacy Building, University of Florida, Gainesville, Fla.

Monday, July 20th.

10:00 A.M. Greetings and Registration.
11:00 A.M. Address of Welcome, Dr. T. R. Leigh, Dean, College of Pharmacy.
11:30 A.M. Introduction of Members and Delegates.
12:00 M. Luncheon.
2:00 P.M. Chairman's Address, Dr. B. V. Christensen.
2:45 P.M. Resumé of Pharmacognosy and Drug Cultivation in Europe, Prof. O. P. M. Canis.
3:30 P.M. Appointment of Committees.
5:30 P.M. Lawn Supper for Ladies and Members at home of Dr. and Mrs. B. V. Christensen.
8:00 P.M. "Methods of Turpentining" (illustrated), Dr. Lenthall Wyman, U. S. Forest Service.
8:45 P.M. "Uses of Naval Stores Products," Dr. C. F. Speh, Secretary of American Pine Institute.

Tuesday, July 21st.

9:00 A.M. "Campus Trees and Plants," Major W. L. Floyd, Dean, College of Agriculture.

9:30 A.M. Campus Trip, Dean Floyd and Harold Mowry, conductors.
10:45 A.M. Exhibit in Pharmacy Building, Dr. Christensen.
11:15 A.M. "Medicinal Plant Gardens," Dr. E. L. Newcomb.
1:00 P.M. "Florida Medicinal Plant Garden," Dr. Christensen, Mr. Werner, and Mr. Hiner, conductors.
3:30 P.M. Silver Springs. Boat ride and picnic lunch.

Wednesday, July 22nd.

9:00 A.M. Botany Round Table, led by Dr. H. W. Youngken. Number of hours; justification of course; by whom taught; morphology concurrently with histology.
10:30 A.M. Pharmacognosy Round Table, led by Dr. Bacon: Scope of course; character of information; methods of presentation; use of references; use of illustrative material.
1:00 P.M. Trip to turpentine still and pine products plant.
8:00 P.M. "Tropical and Subtropical Plants of Florida," Dr. Christensen, Mr. Werner, and Mr. Hiner.

Thursday, July 23rd.

9:00 A.M. "Commercial Methods of Evaluating Crude Drugs," A. John Schwartz.
10:00 A.M. "Anatomy of Derris," H. W. Youngken.
10:30 A.M. Business Meeting.
1:00 P.M. Program of Mint Symposium under direction of Dr. F. J. Bacon, *Chairman*.

(Final program to be announced.)

HOTEL ACCOMMODATIONS.

Hotel White House—

Recently renovated and refurnished, large lobby, telephone and porter service, coffee shop in connection, 70 rooms, European plan.

Single room with bath	$2.00
Double room with bath	4.00
Single room without bath	1.50
Double room without bath	2.50

Arlington Hotel—

Large sitting room and sun parlor; running water, hot and cold in all rooms; 46 rooms; free garage.

Single room with bath	2.00
Double room with bath	3.00
Single room without bath	1.50
Double room without bath	2.00

Gainesville Tourist Camp—

Thirty-five cottages consisting of two rooms, screened porch, electric lights, water convenient. Bath with hot water in separate building. Each cottage equipped with stove, table, chairs and beds with springs and mattress.

Rates per Week.

1 full sized bed, without bedding	$4.00
2 full sized beds, without bedding	5.00
1 full sized bed with bedding	6.00
2 full sized beds, with bedding	7.00

Restaurants.

Several restaurants and tea-rooms are conveniently located near hotels and the University Cafeteria near the Chemistry-Pharmacy building where the sessions will be held. Rates for meals are very reasonable.

O. P. M. CANIS, *Secretary-Treasurer.*
B. V. CHRISTENSEN, *Chairman.*

OFFICERS OF AMERICAN MANUFACTURERS OF TOILET ARTICLES.

The following officers were elected at the thirty-seventh annual convention of the American Manufacturers of Toilet articles, held in New York City, April 21st to 23rd, inclusive; *President*, H. H. Bertram; *First Vice-President*, E. B. Hurlburt; *Second Vice-President* and *Treasurer*, D. J. Mulster; *Secretary*, C. S. Welch; *Counsel*, A. I. Smith; *Washington Representative*, W. L. Crounse.

Among the prominent speakers at the meeting were: Commissioner J. M. Doran, who stated that the alcohol regulations require further revision to correct errors and omissions; J. U. Rebeer, who talked on "Radio Advertising;" Northam Warren, who urged the Association to go on record as opposed to the present high tariff policy of the country, and W. L. Crounse, who discussed the Capper-Kelly bill and the industrial alcohol problems, explaining some of the changes in the regulations.

SILVER AND GOLD.

Massachusetts, Nebraska and Virginia will hold Golden Jubilees at their respective conventions this year, and West Virginia has its program arranged for a Silver Anniversary.

JUNE AND JULY STATE ASSOCIATION MEETINGS.

JUNE.

Alabama, Montgomery, June 10th–11th.
Arkansas, Little Rock, June 9th–10th.
Colorado, Troutdale-in-the-Pines, June 16th–18th.
Connecticut, New London, June 24th–25th.
Idaho, Pocatello, June 4th–5th.
Illinois, Joliet, June 24th–26th.
Indiana, Indianapolis, June 16th–18th.
Kentucky, Somerset, June 16th–18th.
Maine, Rangeley, June 24th–26th.
Maryland, Buena Vista, Pa., June 16th–19th.
Massachusetts, Swampscott, June 29th–July 1st.
Michigan, Grand Rapids, June 24th–26th.
Mississippi, Biloxi, June 16th–18th.
Missouri, Excelsior Springs, June 16th–18th.
Nebraska, Lincoln, June 8th–11th.
New Hampshire, Jefferson, June 22nd–23rd.
New Jersey, Atlantic City, June 16th–19th.
New York, Richland Springs, June 16th–19th.
North Carolina, Wrightsville Beach, June 23rd–25th.
North Dakota, Fargo, June 23rd–25th.
Ohio, Steamer Tionesta, Lakes Erie and Ontario, June 14th–18th.
Pennsylvania, Bedford Springs Hotel, June 16th–18th.
South Carolina, Charleston, June 17th–18th.
South Dakota, Madison, June 15th–17th.
Texas, Dallas, June 15th–18th.
Utah, Salt Lake City, June 22nd–23rd.
Vermont, Lake Money Club, Fairlee, June 15th–16th.
Virginia, Virginia Beach, June 22nd–24th.
Washington, Port Angeles, June 22nd–24th.
West Virginia, Wheeling, June 17th–18th.
Wisconsin, Green Lake, June 23rd–25th.
Wyoming, Rock Springs, June 8th–9th.

JULY.

Florida, Miama, July 27th–August 1st.
Montana, Helena, July.
Oregon, Seaside, July 14th–16th.
Tennessee, Memphis, July 21st–23rd.

ARKANSAS PHARMACEUTICAL ASSOCIATION.

Among the speakers at the Arkansas Pharmaceutical Association were Charles E. Wilson of the Mississippi Association, Charles R. O'Malley, Hon. Clyde Eddy, Carl Weeks, and Thomas Roach. Great interest was developed in the Round Table discussion led by Booker Latimer. The sessions were held at the Ward Hotel in Ft. Smith, June 9–10. The President of the Association was W. Earl Brite and the Secretary E. D. Oslin.

TENNESSEE PHARMACEUTICAL ASSOCIATION.

The Tennessee Pharmaceutical Association will be held in Memphis, July 21st–23rd. Congressman Clyde Kelly is expected as one of the speakers, also Amos W. W. Woodstock and Dr. J. J. Durrett. Chairman **E. F. Cook** of the U. S. P. Revision Committee will discuss changes in the Pharmacopœia under revision. Other speakers are President **Julius H. Riemenschneider** and President **H. C. Christensen.** Representatives from a number of states are expected to be present.

LOUISIANA PHARMACEUTICAL ASSOCIATION.

Louisiana State Pharmaceutical Association held one of its largest conventions in the forty-nine years of its existence in Lafayette on May 12th and 13th. Lafayette is known by Evangeline immortalized by Longfellow.

President C. R. Caldwell of Shreveport presided over the meeting. President-elect Walter D. Adams of the AMERICAN PHARMACEUTICAL ASSOCIATION, addressed the convention, extending congratulations and spoke of the work the ASSOCIATION had done and its plans for the future, laying stress upon the importance of the new Headquarters Building soon to be erected in Washington.

Paul Eckels, of Crowley, was elected *President* of the Association and will preside over the Golden Anniversary meeting of the Association which will be held in New Orleans next May and for this elaborate plans are already under way.

From the standpoint of entertainment the convention was an outstanding one. It was marked by a spirit of geniality and hospitality.

AMERICAN MEDICAL ASSOCIATION.

The American Medical Association will meet this year in Philadelphia, the city in which it was founded eighty-four years ago. The new municipal auditorium will be the focal point of the meeting, which will be held from June 8th to 12th; with the exception of the meetings of the House of Delegates, all meetings and exhibits will be held there and in the adjoining Commercial Museum.

OHIO MEDICAL ASSOCIATION.

At the recent annual meeting of the Ohio Medical Association at Toledo a resolution favoring group advertising was defeated. The resolution provided for the question of an annual fund of a million dollars by the American Medical Association to be spent for advertisements in the daily press to bring about a better understanding between the medical profession and the public and to counteract trends and influences inimical to the professions.

Among the reasons assigned for opposing the resolution was that the A. M. A. is already engaged in a systematic program of education.

CHANGES MADE IN THE COLLEGE OF PHARMACY OF THE UNIVERSITY OF PORTO RICO.

BY L. L. VELEZ.

In August 1928, the Faculty of the College of Pharmacy of the University of Porto Rico inaugurated a course leading to the degree of Bachelor of Science in Pharmacy, discontinuing the three-year course which led to the degree of Pharmaceutical Chemist.

The last class of Pharmaceutical Chemists will graduate this month, and the first four-year class will graduate at the end of next year.

A beautiful building is now being constructed in which the College of Pharmacy will be housed at the beginning of the next college year. The building will be more commodious than the present one and will have new and modern equipment.

The Pharmaceutical Coöperative Society of Porto Rico was founded in June 1930, under the auspices of the Porto Rican Pharmaceutical Association. It started its business transactions November 15th of last year. It aims to promote the welfare of its members and to strengthen the bonds of union and fraternity among them.

ST. BARTHOLOMEW'S HOSPITAL TO BE RECONSTRUCTED.

St. Bartholomew's Hospital, London, popularly known as "Bart's" is to be reconstructed. This hospital has served London for 800 years.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

The 90th annual meeting of the Pharmaceutical Society of Great Britain was held at the home office in London, May 20th. The *Pharmaceutical Journal* commenting on the President's address states that it was a clear and cogent commentary on the principal features of the annual report with special reference to pharmaceutical education, examinations, revision work, a new site for the headquarters of the Society, the advantages of branch organizations and services, and a discussion of the pharmacy and poisons bill in Parliament.

President A. R. Melhuish presided and there were present the following members of the Council and officers of the Society: Vice-President F. Gladstone Hines; Treasurer John Keall; Mrs. Freke; Messrs. Antcliffe, Beardsley, Bilson, Guthrie, Hardy, Humphrey, Jenkins, Parry, Rowsell, Simmons, Skinner, Wells and Secretary H. N. Linstead; also Resident Secretary J. Relaford Hill, Scotland; Solicitor W. H. Quarrell and Editor J. P. Gilmour; also a representative number of members.

PROPRIETARY ASSOCIATION.

Among the speakers at the recent meeting of the Proprietary Association, held in New York City were: Dr. J. J. Durrett, James A. Horton of the Federal Trade Commission; Samuel C. Henry, William J. Schieffelin, G. M. Gales, Lee Bristol and Harry Thompson, attorney. All the officers were reëlected for the ensuing year.

AMERICAN PHARMACEUTICAL MANUFACTURERS' ASSOCIATION.

The American Pharmaceutical Manufacturers' Association held a successful meeting at French Lick, Indiana. Among the speakers were: Charles Wesley Dunn, Julius Riemenschneider, R. Lincoln McNeil, Carrol Dunham Smith, Dr. S. M. Gordon, A. L. Starshak, R. A. Whidden, Wroe Alderson, Harry Phibbs, Dr. Morris Fishbein. Dr. H. Sheridan Baketel presided; John G. Searle was elected president of the Association. Further comments will be made in July number of the JOURNAL.

LEGAL AND LEGISLATIVE.

THE FEDERAL TRADE COMMISSION ENCOURAGED.

The Federal Trade Commission is encouraged by the Raladam decision. Commissioner W. E. Humphrey said: "The court stated, in no uncertain terms, that if this element of competition had been proved to the satisfaction of the court, there would be no question whatever regarding the Commission's right to claim a need of protecting the public health in presenting the findings, supported by evidence, which 'warrant the conclusion that the preparation is one which cannot be used generally with safety to physical health except under medical direction and advice.' "

BILL TO LICENSE DOCTORS AS PHARMACISTS WITHOUT EXAMINATIONS.

The Florida Senate Bill seeks to amend the pharmacy practice act permitting the licensing of physicians without examination who for ten years were engaged in the practice of medicine and have been licensed in the state as medical practitioners.

CALIFORNIA LAW SIMILAR TO CAPPER-KELLY BILL.

The California Retail Druggists Association in coöperation with other organizations has made possible a law long upon the statute books practically in the language of the pending measure, the Capper-Kelly Fair Trade Bill, in Congress. The bill referred to was successfully guided through the Legislature without change and as a state law will be a model for other legislatures and will have an effect upon the members of Congress. An effort was made to make distinctions between predatory and other kinds of injurious price cutting without success.

FORT WORTH, TEXAS, NAMED FOR NARCOTIC FARM.

Fort Worth, Texas, has been selected as a location of the new Federal Narcotic Farm west of the Mississippi. Lexington, Ky., was selected for the first farm. The new farm is designed to accommodate about one thousand narcotic addicts from the Federal prison west of the Mississippi, with facilities for other persons who may volunteer for treatment.

CHAIN STORES TAX IN INDIANA UPHELD.

The Indiana law imposing a special license tax on chain stores is constitutional, the Supreme Court of the United States held May 18th in a five-to-four opinion. The case is entitled State Board of Tax Commissioners of Indiana, etc., *et al.* v. Jackson, No. 183.

There are numerous distinctions between chain stores and other types of stores, Mr. Justice Roberts declared in the majority opinion, in which Mr. Chief Justice Hughes and Mr. Justice Holmes, Brandeis and Stone concurred. These differences and advantages in favor of the chains are shown by their number and astonishing growth, he said, and warrant placing them in a separate class for license tax purposes.

The opposite view was expressed by Mr. Justice Sutherland in a dissenting opinion concurred in by Mr. Justice Van Devanter, McReynolds and Butler. "The advantages attributed to the chain store lie not in the fact that it is one of a number of stores under the same management but in the fact that it is one of the parts of a large business, the dissenting opinion ascribed. The fact that the business is carried on under many roofs, and that of others under one only, is not sufficient, and the tax amounts to a clear and hostile discrimination against a selected body of taxpayers," Mr. Justice Sutherland declared.

U. S. TRADE WITH ARGENTINA.

The year 1930 marked the attainment by Argentina of the leading position among the South American markets as a consumer of American medicinals and pharmaceuticals. Having been preceded by Colombia in 1929 in value of medicinal purchases from the United States, Argentina led that country by more than a quarter million dollars at the end of last year. Among the leading world markets for American medicinals Argentina is surpassed only by the United Kingdom, Cuba, British India and Canada.—Assistant Trade Commissioner Thomas C. Ballagh.

BOOK NOTICES AND REVIEWS.

Kostychev's Chemical Plant Physiology. By DR. S. KOSTYCHEV, Member of the Russian Academy of Science, Professor in the University of Leningrad. Translated and edited by Charles J. Lyon, Ph.D., Assistant Professor of Botany at Dartmouth College. P. Blakiston's Son & Co., Inc., Phila., 1931. XV + 497 pages. Portrait and forty-five illustrations. 16.5 × 24 Cm. Price $6.00.

"This book is an up-to-date rendition of a volume which appeared in German in 1926 as part one of the 'Lehrbuch der Pflanzenphysiologie.' The first volume was entitled 'Chemische Physiologie' with the implication that the second volume would deal with the physical aspects of plant physiology." The second volume has not yet appeared but the popularity of the first led the author to revise it late in 1929 for this translation. There are "many radical changes in the subject matter."

The title might be misleading so we quote the author, "Chemical plant physiology is often called 'biochemistry of plants' . . . . . It deals only with questions of material transformations in plants." The subject matter is well arranged as follows: "First there is an exposition of the assimilation of the elements required by plants. Then follows the description of the transformations of the assimilated foods in connection with the various vital requirements of plants. Finally there is a discussion of the biochemical processes which furnish energy to plants . . . . . All these processes are treated as chemical reactions."

The titles of the eight chapters will give a better idea of the scope of the work: The Foundations of Chemical Plant Physiology; The Assimilation of Solar Energy by Green Plants and the Primary Synthesis of Organic Compounds; Chemosynthesis and the Assimilation of Molecular Nitrogen; Plant Nutrition with Prepared Organic Compounds; The Mineral Nutrition of Plants; Carbohydrates and Proteins: The Transformation of These Substances in the Plant; Secondary Plant Substances; Respiration and Fermentation.

To those who do not know Dr. Kostychev's attainments, we might say that his work in almost every phase of this field makes him unusually well qualified for such a task. Of the hundreds of references given in the footnotes, at least two hundred must be to original papers by either the author alone or with the twenty-six different co-authors. One does not have to read far to learn that Kostychev has a good historical background of botany and chemistry. Even so he has not overstressed it. Various theories are well developed and handled. The author finishes with his own ideas. This greatly helps the student.

We question the advantage of as much physical chemistry as given in the first chapter. Where the biochemistry of secondary plant substances cannot be explained we would take the opportunity of pointing out more chemical relations; *e. g.*, in the terpenes how oxidation, reduction, hydration, dehydration and rearrangement will lead from one to another. The same can be said for lactic and pyroracemic acids, also succinic, malic, tartaric, and fumaric acids.

Being pharmaceutical-minded we looked in the index for some plant products of interest to the profession. We could not find the following: oleoresin, gum resin, sapotoxin, and sapogenin. The author has evidently called oleoresins, balsams. Under saponins we found the term sapogenin defined.

Great credit must be given the author for backing up so many statements with a large bibliography ranging from the master pioneers to very recent articles. We regret to find that only the senior authors, of the papers cited, are indexed.

The editor has done well. He was especially fitted for the task, having translated in 1927 Kostychev's Pflanzenatmung, 1924. The book is mechanically well done and almost free from typographical errors. It should be warmly received by plant physiologists, biochemists, and allied professions. We hope that it will be revised periodically.—P. A. FOOTE.

Fighting Disease with Drugs.—The Story of Pharmacy. Edited by JOHN C. KRANTZ, JR. Published for the National Conference of Pharmaceutical Research. The Williams & Wilkins Company, Baltimore. Price $2.00.

Reference to this book has been made editorially in this issue of the JOURNAL and this notice is to call further attention to this important volume, because of the opportunity afforded by it for giving good pharmaceutical publicity. Every druggist will want a copy and, probably, after seeing it, more of them for presentation to physicians and friends of pharmacy.

Without going into details of an extended review a list of the contributors and their

subjects are given: James H. Beal has written the *Introduction;* A. R. L. Dohme tells of the *Dawn of Pharmacy;* E. F. Kelly of the *Source of Drugs;* Heber W. Youngken discusses *Drugs from the Vegetable Kingdom;* William J. Husa writes on *Drugs from Mineral Sources;* John F. Anderson tells of Bacteria-Made Drugs and Vitamins; Roger Adams and Oliver Kamm tell of *Drugs Made by Man;* Ernest H. Volwiler writes on related lines of the former; James C. Munch tells *How Drugs Are Made Uniform;* Robert L. Swain writes of *Drugs, the Law and Public Health;* W. Bruce Philip has prepared a chapter on *The Corner Drug Store* and John C. Krantz, Jr., presents *The Outlook of Pharmacy in the Era of Science.*

The volume contains twenty-six illustrations—portraits of laboratory procedures, of some of those who contributed to the story of pharmacy, to its history, and pictures illustrating the story of drugs. The completion of the book, it seems to us, marks an important event for pharmacy.

Structure Symbols of Organic Compounds. By INGO W. D. HACKH. First edition, viii + 139 pages. P. Blakiston's Son & Co., Inc., Philadelphia. Price $2.50.

This book gives a complete description of the system of structure symbols or chemical shorthand which the author has successfully used for several years with many types of students. The author states that more organic chemistry can be covered with the average class in a given time with the aid of this notation, which is adaptable to both the older and newer concepts of structure.

In the first chapter, the fundamental concepts of atomic and molecular structure are briefly and clearly stated. The second chapter includes a description of the structure symbols. In this system the chemical symbols H, C, O and N are eliminated, these elements being indicated by lines. For example, a point where two lines cross represents an atom of carbon, and a point where a line terminates represents an atom of hydrogen. Double and triple bonds are appropriately indicated. In electronic structural formulas electrons are indicated by dots. In the third chapter, the structural formulas of about 1000 organic compounds are shown in the author's notation. The author does not include a critical review of structure symbols in general, but readers wishing information of this nature will be particularly interested in the bibliography at the end of the second chapter.

It appears that much time and effort would be saved by the general use of a system of chemical shorthand. A notation of this kind might be considered as an extension of the use of the benzene ring. No one would think of discarding the benzene ring. Likewise it seems fair to assume that one familiar with the notation described in this book would not give it up after becoming accustomed to its use.

Examples are given of the application of the notation in research in the prediction of substitution reactions. While the book is intended primarily for students and teachers, it is of interest likewise to the research man or any one interested in a concise notation for organic compounds.—WILLIAM J. HUSA.

An Introduction to Practical Bacteriology. By T. J. MACKIE, M.D. and J. E. MCCARTNEY, M.D. Publishers, Wm. Wood & Co., New York. Price $3.50.

This is the third edition of this book on Bacteriology and should be in the library of everyone who has any routine bacteriological work to do. It is arranged in twenty-three chapters, each written in a very understandable way by two authors who are well known in their field.

The authors have succeeded well in writing a book that contains the more important things in bacteriology without unduly increasing the number of pages. They are to be commended upon the fact that they use Bergey's Classification throughout, and have not neglected any branch of bacteriology, including also a section on "Bacteriological Examination of Water and Milk and the Testing of Antiseptics;" another chapter is devoted to "Tropical Organisms" and various pathogenic streptothrices and mycoses have been given due consideration. The section on the "Malaria Plasmodia" is especially well written and "Filterable Viruses" take up a chapter; bacteriophage is not neglected. Each organism is taken up following a definite method of presentation, which makes it useful as a ready reference, and a folded chart of biochemical reactions of various bacilli is convenient for routine work.

There are a few criticisms that might be offered, such as suggesting an enlargement of the chapter on "The Physiology of Bacteria." The chapter on "Immunity" would be better

placed following chapter VI, the one on the "Use of the Microscope" is probably longer than necessary because the average student in the American schools is well acquainted with the microscope by the time he takes up bacteriology.

A section on "Dark-Field Illumination and the Use of the Dark-Field" is very important; this subject is often neglected because the importance of the Dark-Field is not realized until one becomes acquainted with its value. The chapters on "Cultivation of Micro-Organisms" and "Staining Methods" are well written, and that on "Immunological and Serological Methods" has been brought up-to-date.

The fact that the work is in the third edition shows that it has fulfilled the authors' wishes and aims; it has been carefully prepared and contains more than 400 pages of text matter. The index is quite complete and the illustrations are clear and demonstrate important points. The book fills a want in bacteriological work and the reviewer recommends it to students and also to those who are reviewing the subject.—JOHN M. HAYNES.

Manual der Pharmazeutischen Zeitung. Prepared under direction of the *Pharmazeutische Zeitung* by RICHARD BRIEGER, Ph.D., editor of science of that publication. Published by Julius Springer, Berlin, Germany. 234 pages. Price R.M. 11.

The Preface states that, while there are many formularies, numerous requests reach the publication for formulas and, hence, it has been deemed advisable to collect those given in the columns of the *Pharmazeutische Zeitung* from other sources and publish them in book form.

The formulas are classified but not alphabetically arranged—the first fifty or more pages include cosmetics, toilet preparations, etc.—creams, pomades, hair dyes, waters, perspiration powders, tooth powders, talcums, bath powders and the like. A number of related formulas follow for discolorations, itching; pastes, salves, ointments. Digestive aids, pills, laxatives, purgatives are in another group, including manufacture of tablets. A number of pages are given to solutions of various types of polishes, varnishes, cleaning fluids, deodorizers, disinfectants; inks, manifolding methods; treatments for plants and animals. Miscellaneous items include cements, mucilages, colored fires, dyes and some attention is given to dispensing, laboratory products and methods. The book follows the lines of other formularies, some of the preparations are for German demand, but the greater number are serviceable in all countries. The selection of formulas has been made with judgment and the composition of them indicates that they have been employed in practice.

Quarterly Journal of Pharmacy and Pharmacology. Volume IV. January–March, 1931. Pp. vi + 160. Price 10s. Pharmaceutical Press, London.

We are quoting the *Pharmaceutical Journal and Pharmacist* in the following comment and review: The number of this *Journal* for the first quarter of the present year contains six research papers, three of which are from the Pharmaceutical Society's Research Laboratories, namely: "Poeophyllum Rhizome —American and Indian. Crude Fibre; Tests for the Resins; Adulteration with Guaiacum Wood," by T. E. Wallis and S. Goldberg; "The Structure of Carbohydrates—I. The Synthesis of a 5-Methoxyketose," by Eric Frank Hersant and Wilfred Linnell; and "A Note on the Buffering Substances in Ergot," by Frank Wokes and G. K. Elphick. The subjects of the other papers are "Electrometric Studies of Complex Formation—II. The Tartrates of Bismuth," by C. Morton; "The Isolation and Properties of Visammin, Visammidin, Visnaginin, Visnagidin, Khellinin, Khellidin and Visnagan," by Karam Samaan and the "Pharmacological Actions of Harmol." There are fifty-two pages of abstracts, the subjects being chemistry and its subdivisions, twenty-eight pages; pharmacognosy, two pages; pharmacy and its subdivisions, seven pages; pharmacology and therapeutics, three pages; bacteriology and clinical tests, one page; and new remedies, three pages. There is something for all classes of practicing pharmacists in the *Quarterly Journal*, and the pharmacist in retail business would do well by a study of the abstracts and the list of new remedies to keep himself posted up as to progress in the branches of science which have a bearing on pharmaceutical practice."

The *Quarterly Journal of Pharmacy and Pharmacology* is serving a very useful purpose and American pharmacists will find the publication of great value in the laboratories and in the prescription department.

TENTATIVE OUTLINE OF PHARMACEUTICAL SYLLABUS FOURTH EDITION.

A tentative outline of the Pharmaceutical Syllabus, Fourth Edition, has been completed through the splendid efforts and guidance of Chairman J. G. Beard. It is the first draft of the material planned for the new Syllabus. The points to be considered are whether any course is included which should be omitted and whether others should be added. The mimeograph represents a great deal of work and deserves thanks and appreciation. The Syllabus work has been prepared for not less than 3000 hours of which scientific subjects show over 70%, cultural and basic subjects 20% and business subjects 10%. Chairman Beard is asking for an expression of frank criticism of the work thus far compiled. There are still to be included a manual for examiners by Dr. R. P. Fischelis and an outline of public health for which an author is being sought.

The divisions are: *Principles of Accounting*, by Roy C. Koster; *Arithmetic in Pharmacy*, by Theodore J. Bradley; *Botany*, by Henry Roland Totten; *Bacteriology*, by M. H. Soule; *General Chemistry*, by E. V. Lynn; *Outline of Qualitative Analysis*, by C. B. Jordan; *Outline of Quantitative Analysis*, by C. B. Jordan; *Organic Chemistry*, by E. V. Lynn; *General Economics*, by S. Howard Patterson and Karl W. H. Scholz; *English*, by Baldwin Maxwell; *French*, by Lewis Edgar Winfrey; *German*, by F. W. Bradley; *Mathematics*, by J. W. Lasley and E. T. Browne; *Merchandising, Advertising and Salesmanship*, by Paul C. Olsen; *Pharmaceutical Latin*, by Hugh C. Muldoon; *Insecticides, Fungicides, Parasiticides and Rodenticides*, by Lloyd E. Harris; *Pharmacognosy*, by Bernard Victor Christensen; *Outline of Pharmacology*, by A. Richard Bliss; *Pharmaceutical Chemistry*, by Glenn L. Jenkins; *Bio-Chemistry*, by Lloyd K. Riggs; *History of Pharmacy*, by Edward Kremers; *Outline of Syllabus on Pharmaceutical Technique, Operative Pharmacy* and *Theory of Pharmacy* by Charles H. LaWall, Henry V. Arny, Wm. J. Husa; *Dispensing Pharmacy*, by W. G. Crockett, E. Fullerton Cook, P. H. Dirstine; *Pharmacy Jurisprudence*, by James H. Beal; *Physics*, by Carl H. Fussler; *Physiology*, by R. A. Lyman; Toxicology, by M. R. Thompson.

PUBLICATIONS RECEIVED.

The AMERICAN PHARMACEUTICAL ASSOCIATION has received the following from the Smithsonian Institution for which grateful acknowledgment is made:

"Report of the United States National Museum, 1930." The following bulletins: No. 146, "Life Histories of North American Shore Birds;" No. 147, "Archeological and Historical Investigations in Samana Dominican Republic;" No. 148, "Collections of Objects of Religious Ceremonial in the United States National Museum;" No. 149, "Composition and Structure of Meteorites;" No. 150, "Revision of the Fishes of the Family Liparidæ;" No. 151, "East African Reptiles and Amphibians in the United States National Museum;" No. 152, "The Cancroid Crabs of America of the Families Euryalidæ, Portunidæ, Atelecyclidæ, Cancridæ and Xanthidæ;" No. 153, "Birds Collected by the Childs Frick Expedition to Ethiopia and Kenya Colony;" No. 154, "A Study of the Teiid Lizards of the Genus Cnemidophorus with Special Reference to Their Phylogenetic Relationships;" No. 156, "The Birds of Haiti and the Dominican Republic."

Contributions from the U. S. National Herbarium, Volume 28, Part 1, "The North American Species of Paspalum, by Agnes Chase;" from the U. S. National Herbarium, Volume 26, Part 5, "Notes on Certain Type Specimens of American Asteraceæ in European Herbaria," by S. F. Blake; from the U. S. National Herbarium, Volume 27, "Flora of the Panama Canal Zone," Paul C. Standley; from the U. S. National Herbarium, Volume 26, Part 1, "The Lecythidaceæ of Central America," by H. Pittier; from the U. S National Herbarium, Volume 26, Part 2, "The Piperaceæ of Panama," by William Trelease; from the U. S. National Herbarium, Volume 26, Part 3, "Costa Rican Mosses," collected by Paul C. Standley in 1924–1926, by Edwin B. Bartram; from the U. S. National Herbarium, Volume 26, Part 4, "The Piperaceaæ of Costa Rica," by William Trelease; from the U. S. National Herbarium, Volume 26, Part 6, "Asiatic Pteridophyta," collected by Joseph F. Rock, 1920–1924, by Carl Christensen; from the U. S. National Herbarium, Volume 25, "Flora of Utah and Nevada," by Ivar Tidestrom; "Die Landwirtschaftlichen Versuchs-Stationen," by Prof. Dr. G. Fingerling (110 and 111 Band).

National Association of Boards of Pharmacy. Proceedings of the twenty-seventh annual convention; also proceedings of the joint meeting with the American Association of Colleges of Pharmacy, held at Baltimore, Md., 1930. Published by the National Association of Boards of Pharmacy.

As stated in the above transcript of the title page, this volume contains the proceedings of the meeting of the Association held last year in Baltimore, a roster of officers, past and present, the membership of the various committees, and a list of the state boards holding membership in the Association, including the boards of the District of Columbia and Alaska.

Besides the address of the retiring president, John A. J. Funk, the volume contains several valuable and interesting reports of the meeting relating to various phases of the Association's activities and those of closely related organizations. Among the papers which appear are "Suggestions Regarding Reciprocity," by Robert P. Fischelis, and "Pharmacy in the Navy," by Lt. Com. Lewis H. Roddis, U. S. N. The proceedings are full of information which every pharmacist should have, at least every board member and teachers in pharmacy schools.

Bulletin of the University of Wisconsin, serial number 1732, general series number 1506, relates to phytochemistry by Edward Kremers and co-laborers. This has recently been issued. The prefatory remarks contrast biochemistry and phytochemistry. The comments and objects are discussed nd a historical survey follows. A synopsis concludes the *Bulletin.*

Dr. Francisco Cignoli, member of the International Pharmaceutical Federation, discusses an International Pharmacopœia. The *Bulletin* contains more than thirty pages and has many references to what others have written on the subject, besides the author.

A reprint received from the *Pharmazeutische Zeitung* gives a historical account of the German Apotheke by George Urdang.

The JOURNAL OF THE A. PH. A. has received *Abstracts* of scientific literature having a relation to the official products of the U. S. P. from journals of medicine, pharmacy, chemistry, biochemistry. It is for the year 1930. This is the supplement to the U. S. P. circulars contributed by E. R. Squibb & Sons through the courtesy of F. W. Nitardy, abstracted by the staff of the Brooklyn Plant Library of which Mrs. Pickering is the director. The abstracts have been published under the auspices of the U. S. P. Board of Trustees.

We are in receipt of *British Chemical Abstracts* issued by the Bureau of Chemical Abstracts, Index for 1930. The Index contains over 700 pages double column.

Acknowledgment is made of the receipt of a reprint from annals of medical history on Louis Lewin, by Dr. David I. Macht.

Fourth Supplement to Bulletin No. 2 of the biographical series of Mellon Institute of Industrial Research contains list of books, bulletins, Journal contributions and by members of the Mellon Institute of Industrial Research during the year 1930. It has been complied by Lois Heaton Pugsley.

Reprint is acknowledged from proceedings of tercentenary celebration of cinchona on "Pharmaceutical Preparations of Cinchona," by Wilbur L. Scoville.

We are in receipt of reprints of an article by Dr. John C. Krantz, Jr., and C. Jeleff Carr on "Glycogen Storage in the White Rat When Fed the Roots of Arctium Lappa" published in the *Journal of Pharmacology and Experimental Therapeutics* for January 1931. Also reprint of an address by Dr. John C. Krantz, Jr., on "Heralds of Progress," delivered at the Philadelphia College of Pharmacy and Science, at Founders Day exercises, February 1931.

Laboratory Book for those engaged in the industries related to perfumes and other odoriferous products, by Dr. Oscar Simon, revised by Dr. H. K. Thomas. The volume is illustrated, contains about 100 pages and is published by Wilhelm Knapp, of Halle.

A. PH. A. Members in Florida. Left to right—S. L. Hilton, J. H. Beal, Julius A. Koch.